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With modern medicine, surgery, anæsthesia and antibiotics the average life span has been increased in the last seventy-five years from forty-five to seventy-two years. This has brought to us an aging population; it has stimulated authorities in all fields, political, medical, and

economic, to find ways and means of overcoming their special problems.

In Australia, previous to World War II, the only well-organised rehabilitation on a large scale was for the blind. There we saw used the techniques which have proved so successful in wider spheres: (a) evaluation of the disability, (b) special training to give the patient confidence, (c) vocational training to teach him a trade, (d) placement to find him a job.



FIGURE I.
Paraplegic patient raised to the upright position.

How is Rehabilitation Organized?

Dr. Howard A. Rusk, of the Institute of Physical Medicine and Rehabilitation, New York, has defined rehabilitation as follows: "The preparation of the patient, mentally, physically, socially and vocationally for the greatest degree of usefulness compatible with his abilities and disabilities." Note that "abilities" come first, for one of the essentials of rehabilitation is to develop his latent abilities and disregard or overcome the disabilities.

To attain these ends it is necessary to have large central organizations of highly skilled people working together in a team. This conserves manpower, money and the patient's energy. These teams work in large, carefully planned centres. The initial outlay for building, equipment and

staff for the centre is necessarily great; but in America it has been found that centres become self-supporting with the revenue from insurance companies and private and intermediate patients. To raise this initial finance, in America rehabilitation foundations were established. These are non-profit organizations of interested and influential persons banded together with the following aims: (i) to raise money for rehabilitation, (ii) to give publicity to the project, (iii) to establish fellowships for research, (iv) to establish friendly relations with the public and to gain their support.

In Britain the centres are a government concern entirely.

It has been found most efficient to have one large, well-planned centre for a city the size of Sydney. The site must be carefully chosen so as to be accessible for the



FIGURE II.
French jockey: first step: arm exercises to prepare for handling crutches.

disabled and not far removed from industry, as the final stages of training will be in industry, to which the disabled person is to be returned—the aim being to take him from the bed to the job. There are many special details in planning and equipment of the actual building, such as entrances and doors which admit wheelchairs, ramps for persons on crutches, easy access to all departments, and a specially fitted disabled housewives' kitchen, where these folk can prepare meals for others while learning again to do their daily tasks.

There must be interviewing rooms, a physiotherapy department, an occupational therapy department and a recreation department, facilities for providing meals, and a hostel service for those who are unable to travel or who have been brought from the country.

Finally, there should be a travelling field service for survey work in country areas, somewhat similar to the Far West Field Service so well known in New South Wales.

The patients spend all day, five days a week, at the centre. In the early stages they are taught the acts of daily living—movement, dressing, toilet, taking food—which make them independent. The cooperation of relatives is most essential; they are brought to the centres to observe the techniques, and they continue the training at home. They cooperate well.

The success of the centre depends on the choice of staff. This must be made up of people each highly skilled in his or her own line; but one essential is that all must be interested in people and able to gain their confidence. The director is the keystone of the organization. He must have wide medical experience, he must be cheerful and enthusiastic and able to transmit that enthusiasm to each one of his patients and staff.



FIGURE III.

French jockey; second step: walking exercises in braces with parallel bars.

The medical team consists of a physician, an orthopaedic surgeon, a rheumatologist, a neurologist, a psychiatrist, a surgeon and consultants in the other specialties, as required.

The lay team comprises a records and statistics clerk, an almoner or social worker, a physiotherapist, an occupational therapist, a vocational guidance officer, a splint and brace maker, a speech therapist, a placement officer, and experts coopted from various branches of industry.

The director and the patient and his family are *ex officio* members of both teams.

Who Are Eligible for this Service?

Any person who has suffered an illness or an injury which has rendered him incapable of resuming his normal place in the community is eligible for this service. The types of patients who require these services may be set out as follows: (i) Medical patients: hemiplegics, cardiac patients, arthritics, patients with neurological disorders

(multiple sclerosis, poliomyelitis, paraplegia, cerebral palsy, Parkinson's disease). (ii) Psychiatric patients. (iii) The aged. (iv) Alcoholics. (v) Orthopaedic patients whose convalescence is not complete (those who are recovering from trauma, amputation *et cetera*), who need to be retrained for their own occupation, or who need to be trained for a new occupation according to their remaining abilities. (vi) Surgical patients whose surgical care is ended, but who are not ready for wage earning. (vii) Patients with skin conditions whose disability renders them unfit for their former occupation. (viii) Ear, nose and throat patients, especially those with vertigo. (ix) Patients with speech defects. (x) Disabled housewives. (xi) Patients with thoracic disabilities.

Adequate rehabilitation will hasten the recovery of those who would recover more slowly without it, and will bring back to self-dependence and usefulness a large number of those who would have remained helpless without its aid.

Patients are referred from many sources—from physicians, hospitals, social and government agencies,



FIGURE IV.

French jockey; third step: walking with elbow crutches.

industry and insurance companies—and as the work of the centre becomes known, many ask for help themselves. Accommodation becomes a great problem.

In 1935-1936 a careful door-to-door survey of the disabled was made in the United States of America with the following results. The incidence rates of persons with chronic disease on a particular day were as follows: over sixty-five years, 515 per 1000 of population; forty-five to sixty-four years, 309 per 1000; twenty to forty-four years, 177 per 1000; five to nineteen years, 70 per 1000; under five years, 34 per 1000. Since that time there has been a great increase in the number of disabled, owing to the war and to extended longevity. In the Veterans' Administration alone, where it is possible to work out statistics, there are 1,500,000 partially disabled and 11,000 totally disabled persons—the blind, the armless and the paraplegics.

The total number of handicapped individuals in the United States of America today has been estimated to be 23,000,000, made up as follows: diseases of the cardiovascular system, 10,000,000; hemiplegia, 1,000,000; orthopaedic disabilities, 2,500,000; diabetes, 1,000,000; amputation, 900,000; mental illness, blindness, deafness *et cetera*, the remainder. More appalling is the fact that each of these categories of chronic illness has an incidence which increases the total each year.

The population of the United States of America is roughly twenty times that of Australia, so that if our chronic illness and accident rates are about the same, there must be at least 1,000,000 disabled people in this country.

What Are the Techniques?

The techniques used may be listed as follows: (a) evaluation, (b) psychological testing and supportive therapy, (c) physical training—physiotherapy and occupational therapy, (d) vocational training. All lead up to placement.

Evaluation lays the foundation for the success of all future training. Hitherto the methods used here have been haphazard and the results uneven. The orthopaedic surgeon completes his treatment and sends the patient to a physiotherapist, and possibly to an occupational therapist, but without any over-all planning. If the patient is an injured worker, his disability is assessed by the Workers' Compensation Commission, he receives a lump sum in cash, and is "wiped" from the books as a completed "case". This is a most unproductive approach, as no thought is spent on his remaining abilities, and no attempt is made to develop any that are latent.



FIGURE V.

French jockey; fourth step: walking up and down steps.

The principle of evaluation is the consideration of every aspect of the patient—what his disabilities are, how far they can be repaired, and whether that repair will allow him to return to his former occupation; if not, what other abilities he has, and what is his mental capacity indicating latent ability which could be developed. Above all, his own wishes must be considered if we are to have full, happy cooperation.

To discover all this the patient is examined by each member of the team. An evaluation conference is then held; the team and the patient are present. A suitable programme is worked out with a realistic goal, a time limit is set and the patient begins his task. At the end of the time interval the progress—or lack of it—is reviewed and fresh programmes are worked out. Thus his case is constantly under the notice of the team.

Each case is an individual problem, but as an example of method I should like to tell you of the help that can be given to paraplegics, amongst whom the results are spectacular.

Recently I was asked to review two paraplegics with a view to rehabilitation. Their stories were similar and equally pathetic. Both had spent years in various hospitals and had suffered much pain, both had bladder infection and recurrent pressure sores and now could not move beyond their wheelchairs. They had had much attention from skilled persons, but this attention had failed to produce results through lack of early prophylactic care and long-term planning. Rehabilitation must begin on the day when the patient has his accident or commences his illness, and must follow a carefully planned course.

A third case illustrates what can be done.

This patient is an Australian, who contracted encephalomyelitis while working in London as a member of the Diplomatic Corps. He was completely helpless and could not even sit up. He was brought home in the care of a nurse, but on arrival was told that no more could be done for him medically and that there was no rehabilitation organization to help him. Friends in England arranged his admission to "Garston Manor", a rehabilitation centre for paraplegics, and he returned there. A course of training was worked out to develop his remaining muscle power, braces were made to allow him to assume the upright position, and he was retaught the acts of daily living in a



FIGURE VI.

Device for putting on stockings (knees stiff).

modified form. Now he is back in Australia, living in a flat by himself and looking after himself. He can get into and out of a hire car to come to town, and he earns his living as a script writer for broadcasting.

Kessler's routine treatment of every patient with a spinal cord lesion follows six main phases: neurosurgical, urological, surgical, medical, psychological and physical rehabilitation.

The neurosurgeon cares for the patient during the acute period; he makes the diagnosis, locates the area involved and the extent of the lesion, operates if necessary and prescribes the specific treatment for the care of the bladder and bowels and for the prevention of pressure sores.

The urologist cares for the bladder and kidney conditions, if these are difficult, and for the possible development of the automatic bladder.

The medical problems relate to the general health and nutrition of the patient.

The surgeon closes pressure sores and rectifies deformities of joints.

The psychological factors to be considered relate to personality changes resulting from loss of movement and sensation, and of bladder, bowel and sexual functions; while the physical rehabilitation phase of treatment maintains a normal range of movement of joints, reeducates

muscle power if there is not complete transection of the cord, and provides conditioning exercises to prepare the patient to meet the mental, social and vocational demands of daily living to the maximum of his abilities and in spite of his disabilities.

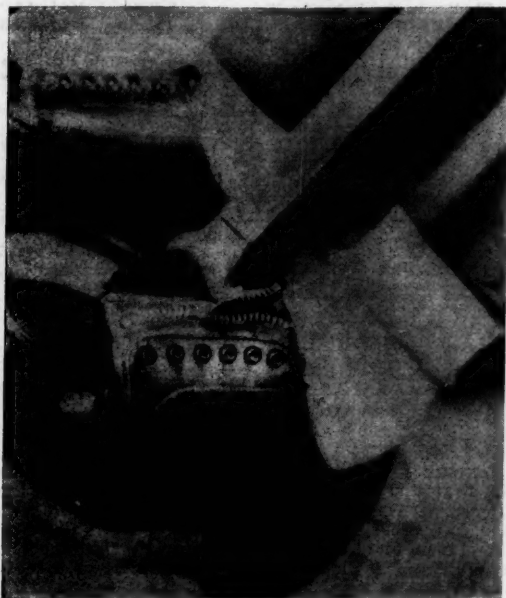


FIGURE VII.
Zippers in shoes.

All these specialists work as a team; every care is taken to avoid preventable disabilities, to raise the patient to the upright position as soon as possible and to make him independent (Figure I).

As a practical example of the work at the Institute of Physical Medicine and Rehabilitation in New York, I quote



FIGURE VIII.
Elastic laces.

the case of a well-known French jockey, Paul Francolon. He was thrown from his horse at Longchamps in 1946 and had spent six long years in a wheelchair with no prospect of improvement when he heard that Dr. Howard Rusk was in Paris lecturing on rehabilitation. This gave him new hope. A number of French racing men raised the money to send him to New York, where he arrived in October, 1952. Seven months later he flew home to Paris, changed from a miserable invalid to be quite a "man about town". I have a photograph of him walking down the steps from the aircraft with the help of his canes.

When he arrived in New York his condition was evaluated and a full programme was worked out. The first step was to build up his general health and to fit him with braces to support his legs. Then he started a strict course of exercises to strengthen his arm and shoulder muscles to enable him to use crutches (Figure II). Supported by leg and shoulder braces, he was taught to walk between parallel bars (Figure III). His cooperation was excellent and he progressed rapidly.

The third step, when he had become accustomed to the upright position, was to teach him to balance on crutches to overcome the paraplegic's fear of falling (Figure IV). Then came the exciting stage of learning to walk alone on elbow crutches or "Canadian canes", first on the flat and then up and down stairs (Figure V).

While persevering with his exercise training he spent a prescribed time each day learning the watchmaker's trade in one of the hospital workshops. No matter what a patient's future plans may be, he is given extra tuition in



FIGURE IX.
Eating devices.

his own occupation or training in some other trade of his choice which will make him self-supporting. Vocational training is an integral part of the institute's rehabilitation course.

The programme demands considerable effort on the patient's part, and he is glad to relax for meals and for the organized recreational pursuits with other patients of his group. Francolon was encouraged to take an interest in his personal appearance and frequently went out on sight-seeing tours. Before returning home he visited Belmont Racecourse, New York. He is now in his own business in Paris; he is completely self-supporting and capable of going alone to and from work.

What Are the Results?

Francolon's story speaks for itself, and so does the following, told by Kessler.

A veteran of the Pacific war was so grossly wounded that he needed amputation of both arms, one leg, one testicle and part of his jaw. He also had numerous shrapnel wounds to be repaired on various parts of his body. This man now gets about with a triple prosthesis; he is married and has a family, and is a successful business man and a member of his State legislature.

The figures shown in Table I, from a study by Rusk of 208 patients admitted to his institute in 1949 and

followed up in 1952, give adequate proof of what has been accomplished.

Dr. George Deaver, of New York, carried out another interesting experiment with a group of chronic neurological patients of advanced age, including veterans of World War I, most of whom had been in hospital for long periods—up to ten years. Some had not been out of bed for two years or more. Patients were selected by the



FIGURE X.
Eating devices.

psychiatrist and the neurologist, and individual programmes were worked out. At first progress was very slow, but at the end of twelve months the hospital reported the following remarkable results: number of patients, 105; excellent recovery, return to employment, 44; discharged from hospital, 9; in hospital, achieved self-care, continuing therapy, 40; failures, 12.

TABLE I.

Status.	At Admission. (208 Patients).	At Follow-Up (208 Patients).
Capable of employment	38 (18.3%)	124 (59.7%)
Capable of self care only	39 (18.7%)	46 (22.6%)
Not capable of self care	131 (63.0%)	38 (18.7%)

Conclusion.

I have told you why rehabilitation is necessary, how it is organized, which patients it serves, what are the techniques, and what are the results. There is nothing new in the techniques; but it is the organization of a progressive programme for each individual patient with the use of the techniques as a means towards a goal which is ever kept in his mind that brings the happy results.

I am sure that you will agree with me that the prospects for these unfortunate people are very bright if properly organized facilities are available.

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MEDICAL REHABILITATION.¹

By B. G. WADE,
Sydney.

TONIGHT I want to bring to your attention the tragic and neglected state of the disabled housewife. "Housewifery", if I may coin the term, occupies more women than any other single occupation and is a lifetime job. There is no forty-hour week and the only retirement is by invalidity or death. There is no fixed wage to aid the housewife, and there is no union to see that she gets one. She cannot be sacked, but neither can she resign. Owing



FIGURE I.

to the present longer expectation of life in general and to the fact that the female lives longer than the male, there are thousands of elderly widows and spinsters eking out a miserable and solitary existence whilst suffering from some disability. We have all experienced the tragic sight of the last remaining or only daughter sacrificing her whole life to look after an invalid mother, and on the death of her mother, being left alone to spend her old age without anyone to help her.

The main disabilities suffered by these elderly people are as follows: (1) Degenerative joint diseases, particularly osteoarthritis of the knee and hips. (2) Convalescence from or burnt-out rheumatoid arthritis. The number

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on December 9, 1954.

of women in the forty to sixty years age group who develop rheumatoid arthritis for the first time is very great. They do not develop the acute fulminating type of the young adult female, but their disability nevertheless is very real. (iii) Hemiplegia. (iv) Poliomyelitis in early life. (v) Various nerve lesions—more rare.

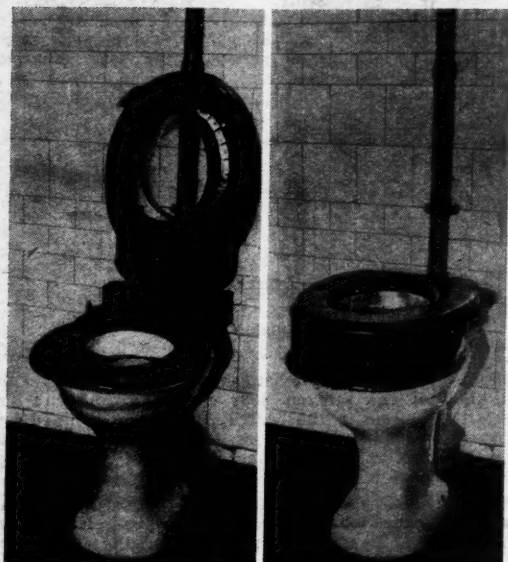


FIGURE II.

Showing adaptation of toilet seat. (From Millard, J. B. (1954), *Ann. Phys. Med.*, 2:103.)

By means of mechanical aids a great deal can be done to help these people to be self-supporting, and in many ways to relieve a second person from the necessity of constant attendance. The effect on their patients' morale is a tremendous step forward in their rehabilitation.

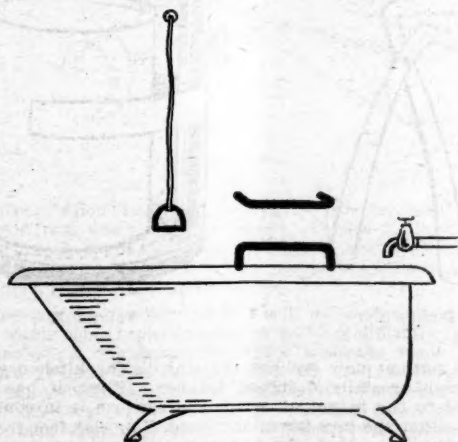


FIGURE III.

The patient's first lesson is to be told how to reorganize her dress, so that all clothes button down the front with large buttons and buttonholes or zippers which she can manipulate herself. No hooks or eyes are allowed.

In England, when the housewife has sufficiently recovered to be able to return home from hospital the physiotherapist and a mechanic accompany her. Their job is to arrange, as far as possible, to have the kitchen made accessible for her. The stove, sink *et cetera* are raised or lowered so that she can work at a comfortable height. The stove,

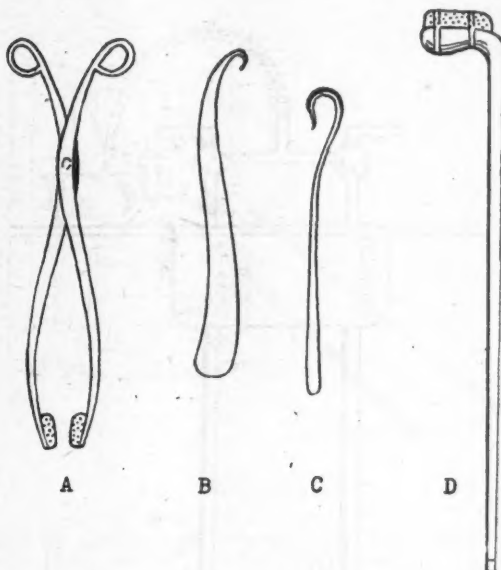


FIGURE IV.

sink and refrigerator are, where possible, joined by means of wooden or iron planks, so that if necessary she can push pots and pans from one to the other without the necessity of lifting them.

The next important mechanical adjustment is to see that the toilet seat is fixed at such a height and slope that it can be used in comfort (Figure I). One simple method

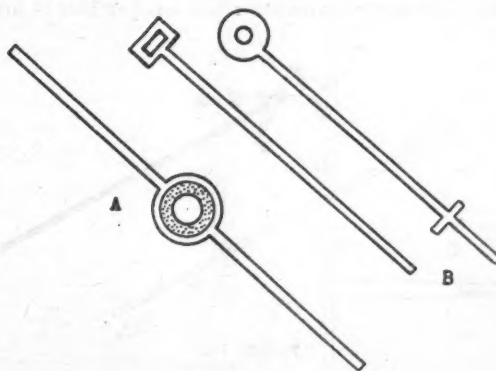


FIGURE V.

of adjusting the toilet seat is to get a second seat and fix a piece of wood four to six inches high on the back of the fixed seat, and the second seat is screwed onto that (Figure II—after Millard). Another piece of wood at the required height to give the necessary slope is fixed on the front. When other members of the family wish to use the toilet this seat can be lifted up out of the way, and the others use it at its normal height and position.

Let us now spend the day with one of these disabled housewives and see what can be done for her.

The majority of Australians have a shower bath, and most of these patients, by the aid of a stool, can manage to have a shower. If the housewife uses the plunge bath, handles should be arranged on the bath and on the wall,

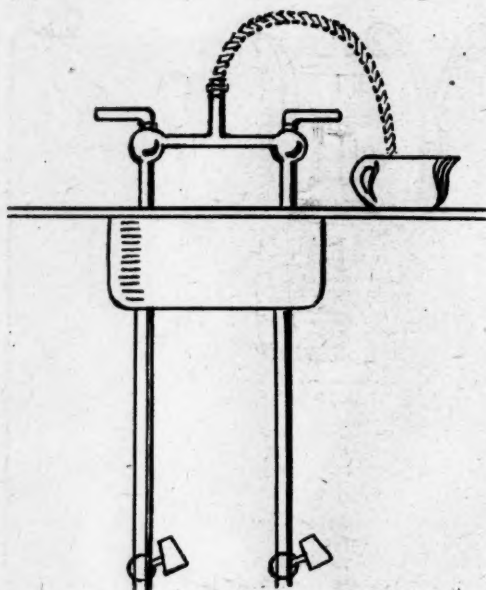


FIGURE VI.

and also there should be a pulley from the ceiling to enable her to get in and out of the bath by herself and thus do without an attendant to help her (Figure III).

Now she goes back to her room and proceeds to dress. Most of these sufferers have great difficulty in putting on shoes and stockings. Now, to enable the patient to put on her stockings, we give her a long-handled pair of tongs

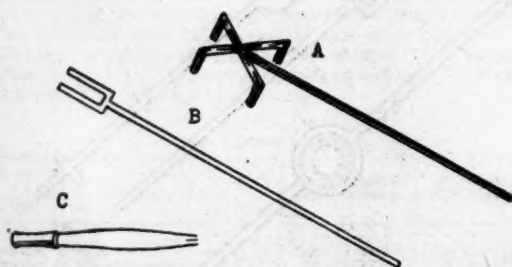


FIGURE VII.

with crêpe rubber in the tips, by which she can take hold of the top of the stocking, work her foot in, and with these long-handled tongs pull the stockings up until she can reach them with her hands. Figure IV, A, illustrates these tongs. Figure IV, B, is a long shoehorn to enable her to get her feet into the shoes. Figure IV, C, is a long-handled button-hook, to enable her to do up her buttons, and by means of the tip, do up zippers.

She now proceeds to the kitchen to prepare herself a meal, as all the rest of the family have by that time left

for work. As most of these people use one or two walking sticks, it greatly adds to their comfort if a piece of crêpe rubber is fixed onto the top of the walking-stick to protect the palms of their hands (Figure IV, D).

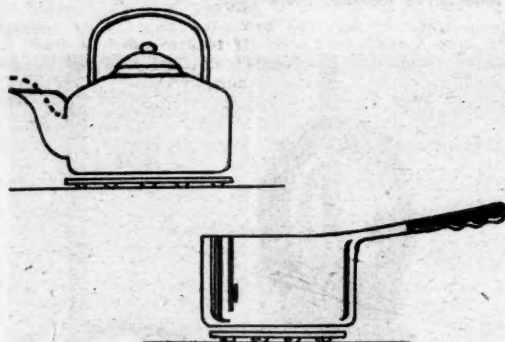


FIGURE VIII.

Having reached the kitchen, she has difficulty in turning the knob of the kitchen door, so we give her a long bar with a circle in the centre; this circle is lined with crêpe rubber and she puts it over the door knob and then, by exerting leverage on the ends of the bar, opens the door (Figure V, A).

The kitchen is dark and she wants the electric light and cannot manage to turn on the ordinary electric light switch, so she is again given a long handle with a circle in the end which she can place over the switch, and push or pull it up or down at will. If it is one of those switches that goes from the vertical to the horizontal, a square end instead of the round one is provided (Figure V, B).



FIGURE IX.

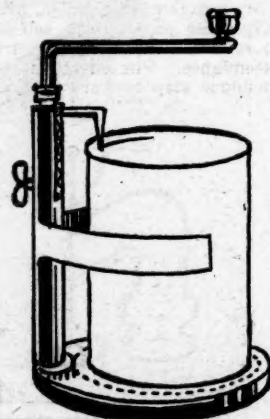


FIGURE X.

The patient now reaches the sink in the kitchen which has been specially designed for her. First, it has been altered to the height at which she can use it in comfort; next, either the taps have long handles or else foot treadles are affixed, so that she can turn the water on and off (Figure VI). The outlet for the water should be of a long goose-necked movable type that she can switch across onto the draining board, so that she has not to hold any kettles or pots underneath the taps and can fill them while they are standing on the draining board. If by chance the taps have not been fitted with long handles and have ordinary T-shaped handles, a claw is given her with a long handle,

by means of which she can turn the water on or off (Figure VII, A). The kettle is now filled and she pushes that across to the stove and onto the burner.

Her next problem is to turn on the gas. Again, if she has difficulty, a long handle ending in a prong which fits on the gas tap is given her, and she can turn the tap on or off (Figure VII, B). Whenever possible, the stove should be fitted with a pilot light. If this cannot be done, one of the so-called "gas wizards" can be supplied to her. These wizards consist of a handle ending in a number of very fine wires; if these wires are placed in the gas when it is flowing, they glow and eventually ignite the gas (Figure VII, C).

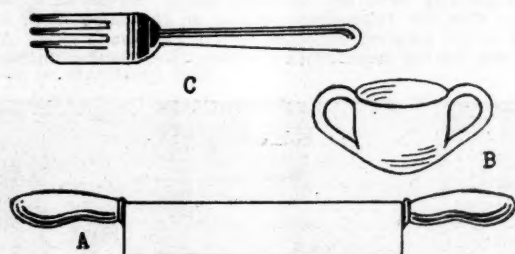


FIGURE XI.

Heavy kettles and saucepans can be fitted with ball-bearings on the base, to enable the disabled housewife to push them along when necessary on or off the stove (Figure VIII). If this type is not available, a small ball-bearing platform can be supplied on which the kettles, saucepans *et cetera* may be placed, and then pushed to where they are wanted.

A universal grip is supplied (Figure IX). This is of the same type as the footprints, but as the jaws are at right angles to the handle, a very powerful grip can be

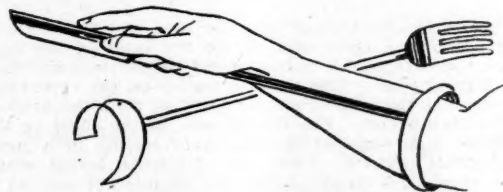


FIGURE XII.

exerted; when necessary, the grip can be used to lift things from one side to the other. Figure X illustrates a mechanical tin-opener; various types are available, but with the one shown here the patient can open tins by simply turning the handle on top.

The patient has now made a cup of tea for herself, and she wants some bread and butter and has difficulty in using a knife. A double-handled knife with the blade in the centre (Figure XI, A) can then be used, with a board through which nails have been driven from the underside; the loaf of bread can be jammed down on these nails and then, by using both hands with the double-bladed knife, the patient can cut whatever bread and butter she requires. She pours her tea into a double-handled cup, and by means of the two handles can hold the cup much more steadily and drink more easily (Figure XI, B).

If she is a hemiplegic, she is given a fork, to one outside prong of which is attached a knife blade, so that she can both cut the food and pick it up with the fork (Figure XI, C).

For the severely rheumatoid patient a long-handled knife and fork can be used, with a clip which goes round the forearm so that the wrist can act as a fulcrum and enable her to use them more or less in comfort (Figure XII).

Usually the cupboards in the kitchen are too high and too inaccessible. To overcome this disability, a round cup-

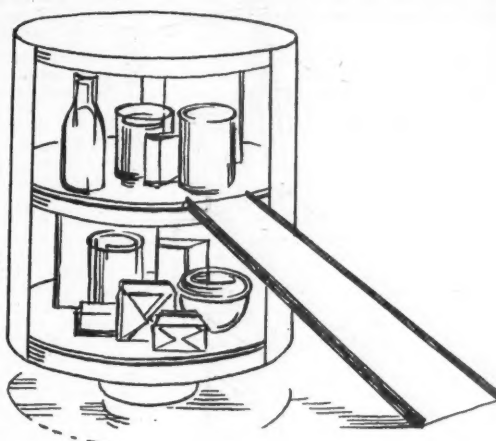


FIGURE XIII.

board on ball-bearings, which can be moved around, is used (Figure XIII). To get things from the top shelf of this movable cupboard, a ramp is used; the jar or bottle or jug, as the case may be, can be slid down this ramp without any lifting at all.

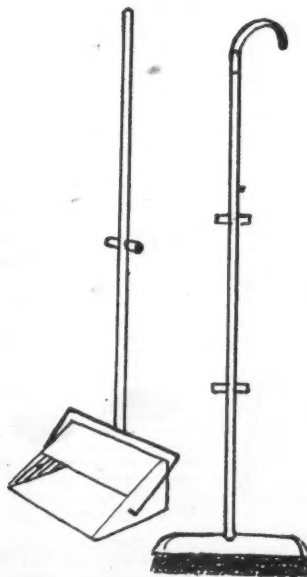


FIGURE XIV.

The patient has now had her breakfast and would like to clean the place a little. For that she has a long-handled dustpan and broom, and can sweep the floor and rake the crumbs into the dustpan with a great deal more ease (Figure XIV).

These people also have great difficulty, particularly those with the osteoarthritic type of knee and hip, in sitting on an ordinary flat chair. The easiest position for them is the semi-reclining position; so the chair is sloped to the height that suits them and they can get their rest by more or less reclining instead of sitting on the chair (Figure XV).



FIGURE XV.

A board in which are various-sized holes can be pulled out from under the table. Into these holes basins fit and can be held firmly. There is a universal fitting which can be used for electric mixers, mincers and vegetable peelers *et cetera*. The subject illustrated (Figure XVI) is using a potato-peeler and has the dish below to hold things without having to hold the basin.



FIGURE XVI.

Now, having prepared her dinner, she has ramps leading from the stove to a movable trolley; down this she can slide heavy dishes, such as a casserole *et cetera*, onto this trolley, and then, using that as a walking-horse, convey it to the dining table. Another ramp to the dining table which is fixed at a little lower height enables her to slide the various dishes onto the table. Conversely, when she has finished and they are empty, without much effort she can push these up the ramp, back onto the trolley and back to the sink, where the washing-up can be done.

So you see, by means of simple appliances, the life of these crippled housewives can be made again useful, and the moral uplift that they obtain is a tremendous step forward in the regaining of their health.

Figure XVII illustrates an ideal kitchen set-up. This was devised by Dr. Cooksey at King's College Hospital, London. I saw here a girl who, owing to earlier poliomyelitis, had her left arm and shoulder girdle completely paralysed. Her right shoulder girdle was also gone, but she had good power in her right forearm. By means of slings from the ceiling, her right forearm was supported, and this girl three times a week cooked a three-course dinner for the personnel of the occupational therapy department. Notice in this illustration that everything is arranged at the same level; the stove burners and oven lead directly onto the draining board; across onto the other side the refrigerator is also on the same level, as also is the rotating cupboard on the right-hand side. At the top the bar from which the sling is suspended enables



FIGURE XVII.

Model kitchen at King's College Hospital for the retraining of the physically disabled.

the patient to move about with her arm still in the sling. There is also a strap attached to the front of the sink which the patient can fasten around herself and give herself more support. The movable trolley on the right-hand side enables the patient to take the food from the kitchen to the dining-room. The sloping seat on the chair on the left-hand side enables the patient to recline in a more comfortable position. This type of kitchen layout would be a great boon to any housewife, disabled or not, as it so greatly simplifies the work.

Many of these aids can be made in the occupational therapy department by the patients themselves, and very many useful suggestions have come from the patients in modification of the various types to suit the individual.

If the patient is confined to a wheelchair, it is important that the arms on that chair can be let down so that the chair can come forward to the table, and in the kitchen also can fit under the area in which she is working, to avoid any undue stretching in reaching for what she wants.

It would be preferable to have the aids to open the doors and the electric light switches attached to the side of the door, to avoid the need for the patient to carry them around with her; or else she may have a long pocket in the outside of her skirt in which she can slip these various things as she is moving from room to room.

You can see that it is no longer necessary for such a patient to be condemned to a life of semi-invalidism; she can make herself self-supporting. This will make possible the release of some person for her own gainful occupation, rather than having to spend her life in looking after such an invalid.

A PRELIMINARY REPORT ON A FORM OF ENCEPHALITIS IN NEW GUINEA.

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THIS report concerns a number of patients who suffered from an apparently new form of encephalitis, in the Morobe District of New Guinea, between 1952 and 1955. The data are incomplete, and I offer no definite conclusions but rather a few speculations; but as I am leaving New Guinea shortly, I feel that I should place my observations on record now.

General Considerations.

Certain general considerations relevant to the subject may be mentioned first.

1. While practising at Bulolo from 1931 till 1941, and from 1946 till July, 1952, I did not see any patients with the symptoms here described, and as far as I know this is an entirely new disease in this locality.

2. Across the Watut River to the south is the Kukukuku country, which has been partly opened up only in the last few years. Since all these patients have come from areas close to the Kukukuku country, there is possibly a connexion of epidemiological significance.

3. During 1952 I had been sending random samples of blood serum to Dr. G. Anderson at the Walter and Eliza Hall Institute of Medical Research in connexion with a survey of Murray Valley encephalitis, and it had been established that this disease had occurred among natives of the northern part of the New Guinea mainland during some few years previously.

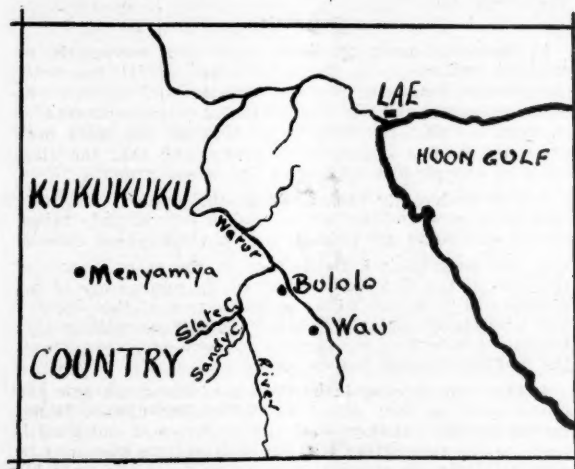


FIGURE 1.

Map showing portion of the Morobe District of New Guinea.

Reports of Cases.

Four patients (Cases I, II, III and VI) were Central Highlanders; two (Cases IV and V) were natives from villages on the fringe of the Kukukuku country; one (Case VII) came from Wain; the remainder were Europeans, all from Bulolo except one (Case VIII), who lived in Lae but had worked at Menyamya in the Kukukuku country shortly before the onset of his illness, and was working at Wau when the onset occurred. Of the natives, one (Case V) was clearing scrub near Manki village for a few days prior to becoming ill, and the others were employed in gold stulcing.

CASE I.—On July 7, 1952, Wauwi was carried into Bulolo from Sandy Creek. He was comatose, flaccid, with no control of his sphincters; no deep reflexes could be elicited; his pupils were half dilated, and did not react to light; his fundi were normal. He had been vaguely ill for two days and had become comatose during the night of July 6 and 7. There were no malaria parasites in his blood; his white cells numbered 12,000 per cubic millimetre; his cerebro-spinal fluid was under slightly increased pressure and was clear and colourless. During the next few days his temperature ranged from 99.5° to 100.5° F. and his pulse rate from 80 to 96 per minute.

Massive doses of penicillin were given. On July 9 he recovered consciousness, but he continued to be irritable, intractable and irrational, and so was transferred to the mental ward of the Administration hospital at Wau on July 12. On July 25 a sample of his blood serum was taken and sent to Dr. Anderson.

CASE II.—On July 23, 1952, Tatepa was brought in from Slate Creek. He was deeply comatose, but his teeth were clenched and he lay curled up on one side; he resisted any attempts to straighten him out; he passed urine and faeces into the bed. His blood contained no malaria parasites; his white cell count was 5000 per cubic millimetre; his cerebro-spinal fluid was under slightly increased pressure and was clear and colourless. His axillary temperature ranged from 99.8° to 101° F. and his pulse rate around 96 per minute. Massive doses of penicillin were given. On July 26 he recovered consciousness, but was disoriented and quite childish. On August 20, still childish and becoming mildly destructive, he was transferred to Wau. A series of serum samples was sent to Dr. Anderson.

CASE III.—Late in July, 1952, a native from Slate Creek was taken to Wau and admitted to hospital with a provisional diagnosis of cerebral malaria. He was examined on July 25 by my assistant, the late Mr. W. G. Wright, who reported that his symptoms were identical with those of the two previous patients; examination of a thick blood film showed no malaria parasites. This native died without recovering consciousness.

CASE IV.—On September 14, 1952, Hawu was brought in from Slate Creek. He was semi-comatose, resistant and violent, attempting to bite when handled. He had been in this state for eighteen hours. His temperature and pulse rate were normal. There were no malaria parasites in his blood. Massive doses of penicillin were given. On September 22 he became fully conscious and ceased to be violent. On September 22 he appeared to have recovered fully and was discharged from hospital.

CASE V.—On October 10, 1952, Sayu was brought to hospital deeply comatose, flaccid, without sphincter control. He had been comatose for twenty-four hours. His deep reflexes were absent, his pupils were three-quarters dilated and did not react to light. His cerebro-spinal fluid was not under increased pressure, and was clear and colourless. His blood contained no malaria parasites; his white cells numbered 7000 per cubic millimetre. His axillary temperature was 99.6° F. and his pulse rate 84 per minute. Massive doses of penicillin were given. A sample of blood serum was sent to Dr. N. F. Stanley at the Prince Henry Hospital. His condition deteriorated, his coma deepened, and he died on October 14. At autopsy there was nothing abnormal about any of his organs, except that the meninges and surface vessels of the brain were rather congested. Pieces of brain and spinal cord were sent to the Walter and Eliza Hall Institute.

CASE VI.—On November 1, 1952, Yanumi was brought in from Slate Creek. He was semi-comatose and restless; his deep reflexes were doubtfully present; his pupils were partly dilated, but reacted sluggishly to light. He complained of headache. His temperature ranged from 100° to 102° F. and his pulse rate from 100 to 112 per minute. Penicillin was given. He completely recovered consciousness on November 2, made a rapid recovery, and was discharged from hospital on November 6.

Results of Tests in Cases I to VI.

1. None of the blood sera showed any evidence of Murray Valley encephalitis. Up to this point I had postulated that, with collateral evidence of a former epidemic of this disease in New Guinea, the present outbreak might be identical.

2. We had recently had an outbreak of Bornholm disease at Bulolo, and sera tested by Dr. N. F. Stanley had shown that the Coxsackie B strain T 80 was responsible. Sayu's

and Hawu's sera gave negative results to tests with Cocksackie T 80.

3. Hawu's serum was tested against Cocksackie B strain K 137, which was responsible for the Cocksackie encephalitis outbreak in New South Wales, but the results were negative.

4. Hawu's serum, when tested against Cocksackie A strains W 32 and A 145 (responsible for herpangina), gave positive results.

5. No Murray Valley encephalitis virus was recovered from the brain or spinal cord from Sayu.

Further Cases.

CASE VII.—No further encephalitis patients were seen until the evening of June 3, 1954, when Amungor walked in from Sandy Creek. He was just able to stagger into hospital; he was reported to have had a temperature range of 100° to 101° F. for two days. His patellar reflexes were exaggerated. His temperature on his admission was 97.4° F. and his pulse rate was 120 per minute. There were no malaria parasites in his blood. He complained of headache. He was given thiamin, 25 milligrammes intramuscularly. Early next morning he sank into a deep coma, became flaccid and lost control of his sphincters. Massive doses of penicillin were given. His temperature continued to range from 97.8° to 99° F. and his pulse rate from 110 to 120 per minute. On June 9 his temperature rose to 101° F. and his pulse rate rose to 132 per minute; his coma deepened; his cerebro-spinal fluid was under slightly increased pressure, and was clear and colourless, containing 900 cells per cubic millimetre, mostly lymphocytes. He died on June 10. At autopsy all organs were normal, except that the meninges were congested and very tense, and when they were incised a large quantity of cerebro-spinal fluid, clear and colourless, ran out under slightly increased pressure; the surface vessels of the brain were congested and the brain substance was soft, perhaps even slightly pulpy.

CASE VIII.—On June 28, 1954, I saw A. at Lae in consultation. On June 26, at Wau, he had developed a severe headache and a raised temperature, and had vomited food. Next morning he finished his work at Wau, was driven to Bulolo and did some more work, then flew to Lae, where he did some more work. He went home to dinner, appeared to be off colour, ate a little food and went to bed. At 2 a.m. on June 28 his wife was awakened by his heavy snoring breathing and could not rouse him. He was admitted to Lae hospital in coma, with a moderately high temperature and a relatively slow pulse rate. He could not be roused, his pupils were half dilated and fixed, he had lateral nystagmus and he was very restless. He passed urine into the bed. His cerebro-spinal fluid was clear and colourless, and at one stage contained a small amount of a reducing substance. His white cells numbered about 16,000 per cubic millimetre. His fundi were normal. He had had some penicillin, without apparent effect. On June 28 he was given, intravenously, 250 milligrammes of "Aureomycin" in 25 cubic centimetres of glucose-saline. From then on his condition improved; his temperature fell and he regained consciousness on June 29, although he was confused and disorientated for four or five days more. For some time he felt very tired and weak, with a pain in his back when he moved or coughed. Finally he returned to work; he had no memory of having done any work at Bulolo or Lae, although he later used the notes he had made and found them complete and adequate. Men with whom he had worked at that time said that he did the right things and asked the right questions, but tended to repeat himself a lot.

CASES IX to XVII.—During December, 1954, and January, 1955, I examined a series of patients who complained of severe and persistent headaches, some frontal but most generalized, worse on suddenly moving the head. Some of the adults had normal temperatures, two had slightly raised temperatures, and two small children had temperatures up to 102° F., with pulse rates up to 112 per minute. In none were malaria parasites found in the blood. These headaches did not respond to A.P.C., "Veganin", "Dilantin", "Luminal" or "Nembutal"; they lasted for from four to eight days if untreated, and were accompanied by a feeling of muscular tiredness and sometimes slight aching. Of the first four patients in the group, two had normal white cell counts and one had 5000 and one 6000 cells per cubic millimetre. No other symptoms or signs were apparent.

After the first three cases, which ran their course and subsided, I wondered if this was a mild form of the encephalitis, and tried chloramphenicol and "Achromycin" on alter-

nate patients. Each of these drugs seemed to have a beneficial effect, as the temperature returned to normal within twenty-four hours and the headache disappeared within forty-eight hours, and there were no further ill effects.

CASE XVIII.—On January 6, 1955, B. developed a severe general headache, and his arms and hands felt weak. He took an A.P.C. powder and went to sleep. By the time he had been at work for two hours next morning his headache was much worse, and he finally "collapsed" at 10 a.m. On his admission to hospital he was semi-comatose, but could be roused and was then rational. He had no symptoms beyond general weakness, worse in the arms and hands, and a very severe headache, worse over the occiput and down the back of the neck. He had no neck rigidity, and movement of his arms and hands was free; his grip was weak but coordinated, and all his deep reflexes were present and normal; his pupils were half dilated but reacted to light; his fundi were normal. His temperature was 100.6° F. and his pulse rate 96 per minute. His white cells numbered 15,600 per cubic millimetre, and were in normal proportions; there were no malaria parasites in his blood; his cerebro-spinal fluid was under slightly increased pressure (four drops per second) and was clear and colourless; it contained no reducing substances. At 11.30 a.m. he was given 1,200,000 units of "Tardocillin" intramuscularly and 500 milligrammes of "Achromycin" orally. That evening his temperature rose to 101.8° F., but his pulse rate remained around 80 to 88 per minute. Shortly after his admission to hospital his coma deepened; he was harder to rouse, and then he would start up with a fright; he was disorientated and confused, but could still take drinks and use the urinal. "Achromycin" therapy was continued at the rate of 250 milligrammes every four hours. At 2 a.m. on January 8 his temperature started to fall; it was normal by 6 a.m., and did not again rise above normal. Also, on January 8 the coma lightened; he was very drowsy and slept deeply and continuously, but could easily be roused, and although still disorientated he was much more rational. All weakness of his arms had disappeared, the headache was bearable and lessening, and his only complaint was of weakness and tiredness. He had no memory of events from just before he fell down at work until the morning of January 10. From then on he made an uninterrupted recovery and was discharged from hospital on January 17.

Discussion.

1. Obviously none of these cases was meningitis or cerebral malaria. In Cases VIII and XVIII especially the possible diagnosis of acute anterior poliomyelitis was seriously considered, but the weight of evidence seemed to be against this. It seems to me that all the cases here presented form a homogeneous group, and that the diagnosis of encephalitis will cover the whole group.

2. The moderately raised temperature with a relatively slow pulse rate, and the low, normal or only slightly raised white cell counts are indicative of a virus-caused disease.

3. The geographical distribution of the cases is around the edge of the Kukukuku country; the appearance of the disease has coincided with the opening up of this country and with closer contact. It is a legitimate speculation that possibly this form of encephalitis has been endemic amongst the Kukukukus, and is now spreading.

4. The occurrence and distribution of cases, sporadic and unconnected as they are, suggest that the disease is not spread directly; analogy with similar forms of encephalitis leads to the speculation that an intermediate host may be responsible for its spread; local conditions would probably limit such a host to either a mosquito or the house-fly, with the mosquito as first choice. Lice, mites, ticks and leeches can hardly enter into the picture.

5. In spite of evidence that Murray Valley encephalitis has occurred in New Guinea during the last few years, this present condition is not apparently due to the M.V.E. virus. And since there is a certain amount of cross-immunity between Murray Valley and Japanese B encephalitis, it would seem that the latter condition may also be eliminated.

6. Other serological evidence is too scanty even for speculation.

7. It seems that massive doses of penicillin, of the order of 1,000,000 units given intramuscularly, or full doses of "Achromycin" or chloramphenicol by mouth, produce a rapid and complete cure, provided that the condition is not

so far advanced as to have already caused serious cerebral damage. I have not so far had an opportunity to try "Achromycin" intravenously, but it is reasonable to suppose that it would also act efficiently; an improvised injection of "Aureomycin" appeared to have a beneficial effect on one patient.

8. It would seem advisable that in this locality severe persistent headache without any obvious cause, especially if accompanied by a moderate rise of temperature and by lassitude or muscular weakness, should be treated with full doses of penicillin, chloramphenicol or "Achromycin".

9. The most likely and most dangerous other cause of similar symptoms would be *Plasmodium falciparum*. An intense boring headache is the chief symptom of one form of cerebral malaria; the fulminating form is generally introduced by convulsions in children or by a sudden collapse resembling a stroke in adults; the third form is quite obvious, supervening on insufficiently treated malarial fever. Coma follows on any of these. A history of a rigor at any time during the previous forty-eight hours is significant, but there is no limit to the variety of malarial symptoms, and an immediate careful search of a well-stained thick blood film is obligatory in every instance.

THE PATHOGENESIS OF BRONCHIAL CARCINOMA.

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Sydney.

THE problem of the aetiology of bronchial carcinoma is as yet unsolved, but it is profitable to review facts and figures and fancies and to spend some time in discussing the relative importance of certain features. I propose to discuss briefly but critically a number of factors which seem to me to be important in this subject. Many of these will also call for additional comment from the point of view of the pathologist.

Numerous observations have been made recording an increased incidence of bronchial carcinoma, but there are still some who consider that this increase is not absolute. From clinical observation over the last twenty years I have no doubt that there is an actual increase in incidence, and I have not seen any figures which really deny this conclusion.

While passing reference will be made to certain carcinogenic agents and their effects on individuals exposed to them in industry, it is the increasing incidence in what one may call the general population without any obvious exposure to known carcinogens that calls for explanation. Most of the present evidence relating to possible causative factors is based on statistics. This method of investigation has already proved its value in drawing attention to such causative factors, and it is now imperative to follow more critically the lead thus given. Statistical evidence alone is not acceptable as adequate proof of the aetiological significance of any factor.

Carcinogenic Agents.

In any discussion on the pathogenesis of cancer, reference must be made to carcinogenic agents. Some of these have a direct bearing on the problem of aetiology of lung carcinoma, while others will be mentioned on a more general basis.

Inorganic Agents.

Arsenic, iron, cobalt, radium, nickel and some chrome salts must all be mentioned, for there is good circumstantial evidence for their incrimination. The evidence is mainly dependent on observation in industry, but some of Campbell's (1943) experimental work in mice gives support to this view. However, final proof is still lacking.

Organic Agents.

After a number of years' research by Kennaway and his team and many others, a pure carcinogenic polynuclear

hydrocarbon was isolated from coal tar in 1933. Many similar synthetic carcinogenic hydrocarbons have since been produced, of which dimethylbenzanthracene, benzpyrene and methylcholanthrene are the most important. The length of time required for the production of a malignant lesion by the application of these substances depends upon their molecular configuration. A malignant lesion may occur at a site remote from that to which the carcinogen is applied. Methylcholanthrene is of particular interest, because it has also been produced from cholesterol. It is worth noting that there are three steroids in the body that have been transformed by chemical processes into active carcinogenic hydrocarbons, and this suggests that comparable processes may occur in the body. There is no present evidence that such can or does occur in the body; but equally there is none to exclude this possibility as a factor in carcinogenesis.

Dodds (1948) has pointed out that there is evidence to support the view that a short-term contact with a carcinogen early in life may lead to the presence of clinical malignant disease many years later. He quotes observations made in regard to carcinoma of the upper part of the respiratory tract in workers exposed to the dust in the process of refining of nickel and preparation of copper sulphate. A man may be discharged from this work after two or three years' exposure and be perfectly well for many years before developing cancer in the nasal passages. Wynder and Graham (1950) in their series of cases of bronchogenic carcinoma quoted three patients who did not smoke for at least ten years, but who had previously smoked heavily for some thirty years. It would seem, in a few instances at least, that we can postulate an instigator or initiator effect. If so, it is then logical to expect a trigger mechanism, and as there are a variety of totally unrelated carcinogenic agents, there must be a variety of trigger mechanisms which will set off the malignant process possibly in persons who have previously come under the influence of an instigator effect. Further, the additive effect of the various carcinogenic agents in less-than-effective individual trigger doses still needs to be assessed.

Heredity.

Heredity is not usually regarded as a factor in the aetiology of malignant disease; but there are two points worth noting in relation to bronchial carcinoma.

The mouse is the animal most generally used in experimental work in this disease, and it is possible to produce strains which are either very susceptible or very resistant to the development of lung tumours; this has been reported by a number of workers.

It has been suggested by Campbell (1943) that there is some factor of in-breeding in the Czechoslovak pitchblende miners, although radium or arsenic or some other factor may act as the trigger. These substances do not appear to be so active in producing lung cancer in miners elsewhere, so that some inherited factor could explain the difference. Further, the higher incidence of the disease in men who have never worked in the Czechoslovak mines but have worked in the surrounding districts suggests that there is some factor other than the dust in the mines.

Sex Incidence.

The sex incidence of this condition is remarkable, and figures quoted from various countries indicate the same fact (Table I).

It is fairly obvious that whatever the cause or causes of bronchial carcinoma, the effect must be greater in the male. The post-war increase is also worthy of note.

There is no obvious reason for this difference on any known endocrinological basis. It is tempting to explain it on the basis of different occupations and different habits such as smoking. Moersch and McDonald (1953) have compiled some interesting figures in relation to the predominant cell type in a particular tumour and to the sex incidence in their series of 1000 proved cases at the Mayo Clinic. In the squamous cell and small cell types the male predominance is about 29:1, whereas in the adenocarcinoma

and the larger undifferentiated cell type the predominance is about 4:1.

Environment.

As the increased incidence of the disease is not related directly to industry, it would suggest that the cause lies in some factor which affects the general population and particularly the males. On the assumption that the carcinogenic agent reaches the lungs directly by inhalation—and this is the most likely route—it has been suggested that the inhalation of known factors likely to cause the disease could come from the dust of tarred roads, exhaust gases from motor-cars and other engines, effluvia of various industrial plants including gas works, and soot and fumes from domestic chimneys. Although a great many observations have been made along these lines, there is very little evidence forthcoming to associate the increased incidence with any of the factors. Stocks noted a definite relation between the hours of sunshine in England and the incidence of bronchial carcinoma, the

heavy smoker does favour the opinion that his indeterminate lung lesion is malignant.

Association with Other Broncho-Pulmonary Conditions.

Silicosis.

Vorwald and Karr (1938) undertook a survey of men exposed to silica dust, and among some 15,000 persons examined there were only three cases of lung carcinoma. Autopsy findings on 3000 odd subjects exposed to dust, compiled from the literature and their own series, showed 30 cases of lung carcinoma, an incidence of less than 1%. This figure is lower than that reported in routine autopsy examinations of the general population. It was concluded that inhaled dusts, except those containing recognized carcinogenic substances, cannot in general be considered as etiological factors in the development of primary pulmonary carcinoma. This view is supported by the experience of observers engaged in the coal-mining and associated industries in this country.

The experimental work of Campbell (1943) with mice exposed to various types of dust suggests that there is an increased incidence of primary lung tumour in the mice thus exposed. However, the evidence indicates that the factors responsible for this increase are chemical and not mechanical.

In that particular form of silicosis in which the worker inhales magnesium silicate and develops pulmonary asbestosis, there is a particular tendency to develop bronchial carcinoma. Homburger (1943) observed eight cases of asbestosis in his laboratory, and in four of these carcinoma of the lung was found, the asbestosis body being embedded in a mass of carcinoma cells.

Pulmonary Tuberculosis.

It is not now unusual to find a patient, usually a male, suffering from coexistent pulmonary tuberculosis and bronchial carcinoma. In most instances the tuberculosis infection has been of long standing. This finding is not surprising now that we are noting a rising incidence of pulmonary tuberculosis in the male in the fourth and fifth decades of life, for this is the age period when bronchogenic carcinoma is seen most frequently. I suggest that the finding is coincidental and that the two conditions are not etiological related. Reiss *et alii* (1952) report the occurrence of seven cases of pulmonary tuberculosis in their series of 70 consecutive cases of bronchial carcinoma, an incidence of 10%. Shefts and Hentel (1950) forecast that there will be an increasing incidence of coexistence of these two diseases for similar reasons.

Other Infections.

Since the time of Virchow, squamous cell metaplasia of bronchial epithelium has been noted in various pathological processes, particularly inflammation. Weller (1953) has noted in patients with primary lung carcinoma a high incidence of areas of metaplasia of the bronchial mucosa; but in no instance has he demonstrated a malignant change in such an area. In bronchiectasis, in which metaplasia is pronounced and granulation tissue is frequently found, the development of squamous cell carcinoma of the bronchus is, in my experience, a rarity. I have seen it only once, and on that occasion Geoffrey Davies expressed the opinion that this was one of the commonest precursors of squamous cell carcinoma. On the other hand, such changes in the mucosa may render it more susceptible to some carcinogenic agent.

War Gases and Chronic Lung Disease.

Penington (1954) has recently pointed out that the lung diseases which have been attributed to war gases comprise the syndromes of chronic bronchitis, emphysema and bronchiectasis. There is no statistical evidence for the hypothesis that exposure to war gases during World War I has any relation to the increasing incidence of bronchogenic carcinoma. It has also been observed that mustard gas and other halogen compounds have, in fact, inhibited the carcinogenic effect of hydrocarbons. There-

TABLE I.

Author or Source.	Ratio Male to Female Patients.
West, 1897	3:1
Roberts, 1909	4:1
Maxwell and Nicholson, 1930	4:1
Simons, 1937	4:1
Fulton: 1610 cases, England (Liverpool), 1944 to 1948	7.8:1
Clemmensen, 1947: Denmark	8:1
Moersch and McDonald: Mayo Clinic, U.S.A., 1000 cases, 1954	8.5:1
Royal Prince Alfred Hospital, 1946 to 1954, 300 cases, New South Wales	7:1

lowest incidence being in those cities with the highest sunshine records. Campbell's (1943) experiments with mice would incriminate tarred road dust and a mixture of dusts with aluminium, silica, iron and calcium. The figures he gives for mice exposed to this dust and for controls indicate a highly significant increase in the exposed mice. The tar-free road dust would also appear to be significant. It is well recognized that most cases come from urban and suburban areas. The lungs of the city dwellers certainly bear the marks of the inhalation of carbon particles; but whether these are themselves carcinogenic or whether they carry with them some other cancer-inducing substance is not known. There is no doubt that the city dweller is exposed to smog which it has been demonstrated contains benzpyrene in varying concentration at varying times and seasons. The distribution of the carbon particles in the lung parenchyma would not appear to account for the increased number of cases in which the site of origin of the tumour is mainly in bronchi, and particularly the larger bronchi. The sex incidence is hard to explain if the causative agent is to be found in the atmosphere.

Tobacco Smoking.

The work of Doll and Hill (1952) in England and of Wynder and Graham (1950) in the United States of America, as well as a number of others, leaves little doubt that there is some relation between the habit of tobacco smoking and the incidence of lung cancer. The evidence would suggest that the pipe and cigar smoker need have little fear, and the same applies to the moderate cigarette smoker. It is the smoking of 20 or 30 cigarettes a day or more that appears to be associated with the malignant process. Doll and Hill (1954) state that the higher the smoking rate, the higher the death rate for carcinoma of the lung. However, certain facts must be remembered. Non-smokers get the disease—men, women and children. It is suggested that the possible carcinogenic agent to be blamed is either arsenic or tobacco tar, possibly benzpyrene. The evidence that such is the case is so far unconvincing. In clinical work, however, the fact that a patient is a

fore, there does not appear to be any evidence at all to favour an aetiological relationship between exposure to gas in warfare and the development of bronchial carcinoma.

Unusual Manifestations of Bronchial Carcinoma.

Joint Changes.

Joint changes are occasionally recognized in cases of bronchial carcinoma without sepsis, and frequently the pulmonary lesion is not recognizable by ordinary methods of examination. The patient may present with rheumatic polyarthritides, hypertrophic pulmonary osteoarthropathy or merely clubbing of the fingers. There does not appear to be any relationship between the type and extent of joint lesion and the site and size of the lung lesion. Considerable improvement has followed removal of the lung tumour, but there is no satisfactory explanation of this manifestation. It is suggestive of some general metabolic or similar disturbance.

Carcinomatous Neuropathy and Myopathy.

As in some cases of bronchial carcinoma there are joint changes, so also in other cases there are changes in the nervous system. In 1948 Denny Brown published a report of two cases of peripheral neuropathy and carcinoma of the bronchus, and since then many writers have described cerebellar degeneration with or without dementia, neuropathy and myopathy associated with carcinoma mainly of the lung, but occasionally of the breast, ovary and uterus. While metastatic lesions in the central nervous system from a primary bronchial carcinoma are well recognized, the interest in these cases is that the nervous system changes are degenerative in type, and are not associated with any deposit of malignant cells. They may be due to some disorder of metabolism, although this has not yet been demonstrated. Viral infection, vitamin deficiency and thyroid or thymus dysfunction have all been mentioned as possible causes without any evidence to support the theory. A further point of great interest is the fact that the nervous system changes may precede the finding of the bronchial carcinoma by periods up to three years. Henson *et alii* (1954) state that it is difficult to believe that there is any direct causal relationship between the two conditions, and he suggests that they are linked through a common cause. As with those cases of joint disease in which improvement follows removal of the lung tumour, so is there in some instances obvious alleviation of the nervous lesions in similar circumstances. Is this improvement possibly associated with the metabolic disturbances of surgery rather than with the removal of the tumour itself? Is there in this aspect of our subject a hint that the cause may lie in some metabolic disorder as yet unrecognized?

Conclusion.

While I conclude in the same way as I began, by saying that we do not know the answer, the following facts are worthy of note:

1. The male to female ratio is increasing.
2. The incidence of the disease is highest among heavy cigarette smokers.
3. An association occurs of bronchial carcinoma with diseases of the joints and the nervous system which are probably metabolic in origin.
4. It is not unlikely that once a tissue has been exposed to an instigator effect, a variety of trigger mechanisms may lead to a clinical manifestation of malignant disease.
5. The need for further intensive research is urgent.

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CLINICAL ASPECTS OF NON-PARALYTIC POLIO-MYELITIS AND A CLINICAL COMPARISON OF POLIOMYELITIS EPIDEMICS DUE TO TYPE I AND TYPE II VIRUS.

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THE terms meningo-encephalitis, aseptic or virus meningitis and lymphocytic meningitis have been applied to cases in which the aetiology is unknown or doubtful. This group of cases has hitherto included many cases of non-paralytic poliomyelitis. More frequent lumbar puncture in patients, usually children, with a mild febrile illness, headache, vomiting and minimal signs of meningeal irritation has led to recognition of greater numbers of these cases.

At Fairfield Hospital the demonstration of characteristic cerebro-spinal fluid changes is an essential prerequisite to the diagnosis of the various forms of virus meningitis, and it has been found that the risks entailed by lumbar puncture in this type of case are negligible. No adverse effects in cases of poliomyelitis have been observed, and a sufficient number of early cases of bacterial meningitis are recognized to outweigh arguments against the procedure in these cases, quite apart from the necessity of accurate diagnosis for epidemiological studies. More than 1000 patients have undergone lumbar puncture without apparent ill effects in the last two years.

Virus Meningo-Encephalitis, 1952-1953.

During the twelve months from May 1, 1952, until May 1, 1953, when 188 patients with paralytic poliomyelitis were admitted to the hospital, there were also 264 cases of virus meningo-encephalitis without muscle weakness in addition to those recognized as being due to measles, mumps and varicella. The number of patients with paralytic poliomyelitis admitted to hospital rose sharply in October and November, 1952, reached a peak in December, and declined by April, 1953; at the same time the number of patients with meningo-encephalitis without muscle weakness rose sharply and declined again.

Clinical Appearance.

These cases of virus meningo-encephalitis without muscle weakness varied in severity. The febrile illness was often

initiated by headache, and at times by a mild gastro-intestinal disturbance which was followed by headache lasting for periods varying from one to three days, occasionally longer, before the clinical recognition of signs of meningeal irritation. Some with the longer history of three or four days were similar to cases of poliomyelitis except with respect to paralysis; but in the majority of cases the history was shorter, often less than twenty-four hours, and the febrile illness mild. The fever and neck and back stiffness in the more severe poliomyelitis-like cases lasted for periods of about four days after the patient's admission to the hospital, whereas in the more frequent mild cases the patients often appeared clinically normal after one or two days.

Cerebro-Spinal Fluid Changes.

The cerebro-spinal fluid findings in all these non-paralytic cases of meningo-encephalitis were similar in most respects to those found in paralytic poliomyelitis.

In the majority there were from 10 to 200 leucocytes per cubic millimetre, which comprised both polymorphonuclear cells and lymphocytes, whose proportions ranged from 20% to 80%, the polymorphonuclear cells predominating in cases in which lumbar puncture was performed early in the disease.

The protein content was usually raised, but not often over 80 milligrammes per 100 cubic centimetres, whilst the chloride and sugar contents remained normal.

Diagnosis.

Since these cases of meningo-encephalitis occurred at the same time as the cases of paralytic poliomyelitis, the diagnosis of non-paralytic poliomyelitis suggested itself; but the possibility that another virus was responsible for an unknown proportion of the cases, particularly amongst the milder group, in which there was disparity between the cerebro-spinal fluid findings, which were like those of poliomyelitis, and the mildness of the clinical syndrome, was a source of perplexity.

This problem was largely solved in the laboratory by the demonstration of type II poliomyelitis virus in the faeces and specific serum antibodies in sufficient of these patients who had presented with all variations of the non-paralytic illness to allow the conclusion that the majority were cases of non-paralytic poliomyelitis (Thayer and Ferris, 1954).

Since they formed a clinical group with similar cerebro-spinal fluid changes, in which the rate of admission to hospital rose and fell with that of paralytic poliomyelitis, and in which the laboratory found a predominating type of poliomyelitis virus and corresponding antibody changes, these cases of virus meningo-encephalitis (except those recognized as mumps, measles and chicken-pox) have been listed as non-paralytic poliomyelitis.

Clinical Comparison of Type II and Type I Poliomyelitis as Illustrated by Cases at Fairfield Hospital, 1952-1953 and 1953-1954.

During the epidemic of 1952-1953, type II was the predominant virus isolated, whereas type I was most frequently isolated from the patients admitted to hospital during the epidemic in 1954 (Thayer and Ferris, 1954).

The type II epidemic occurring mainly during the summer months of 1952 and 1953 was remarkable for the high proportion of patients with non-paralytic poliomyelitis admitted to hospital. Of the 452 patients with poliomyelitis admitted, 264 had no detectable weakness whilst in hospital, and the majority of these illnesses could be classed as mild. Moreover, discussion with general practitioners in Melbourne revealed that during the "peak" of this epidemic an unusually large number of children were examined on account of transient headache and vomiting lasting for twenty-four hours. These were observed in their various homes, and in most cases there was no further indication to send them to hospital (McLorinan, 1954).

Of the 280 patients admitted to Fairfield Hospital mainly during the summer and winter of 1954 (up to August 1, 1954) there were only 94 in whom no muscle weakness was observed in hospital.

Thus during the type II epidemic in 1952-1953 the non-paralytic cases formed 60.3% of all cases of poliomyelitis, whereas during the type I epidemic in 1954 this proportion was only 33.6%.

In 1954 the majority of non-paralytic cases conformed to the more severe cases of the previous year, there being very few of the mild transient illness in which the disparity between the mild clinical signs and the poliomyelitis-like changes in the cerebro-spinal fluid was a feature of the illness.

In 1952-1953, when the type II virus predominated, there were 38 patients with pharyngeal or respiratory paralysis—that is, 22% of all paralysed patients—and in 1954 with type I virus the comparative figure was 33%. Of those patients aged under fifteen years, the proportion with pharyngeal and respiratory weakness was less than in the older age groups in both epidemics.

Conclusion.

A greater proportion of patients with non-paralytic poliomyelitis was admitted to hospital during the type II poliomyelitis epidemic than during that due to type I virus, and the evidence suggests that non-paralytic cases were more frequent during the type II epidemic in Melbourne than during the type I epidemic. The interpretation of this observation depends upon the total number of infections occurring in each epidemic in relation to the number of observed cases and their severity. This information is not available; but the admission to hospital of 122 patients with paralytic poliomyelitis due mainly to type II infection during the summer months of 1952-1953 indicates that the epidemic virulence of the type II virus may be as great as that of type I in appropriate circumstances.

The large number of patients with non-paralytic poliomyelitis admitted to hospital with a mild transient illness, in which the cerebro-spinal fluid changes were characteristic of poliomyelitis during the type II epidemic, provided a minor clinical variation in severity, which was evident in retrospect, but did not form a recognizable syndrome characteristic of type II poliomyelitis. These mild cases were also observed during the type I epidemic, but in much fewer numbers.

There was no evidence to support the tentative observations of the Committee on Typing of the National Foundation for Infantile Paralysis, United States (1953), that the bulbar form occurred more frequently with type II than with type I infection.

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Reports of Cases.

AN EXAMPLE OF POLYAGGLUTINABLE ERYTHROCYTES, AND REFERENCE TO PANAGGLUTINATION, POLYAGGLUTINATION AND AUTOAGGLUTINATION AS POSSIBLE SOURCES OF ERROR IN BLOOD GROUPING.

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PANAGGLUTINATION of erythrocytes results from causes *in vitro*, and once established is a permanent character in the particular blood sample under observation. The change from normal to abnormal red cells is caused by bacterial contamination, usually due to poor asepsis at the time of collection, or to an unsterile container which has been used to store or transport the blood.

Polyagglutination results from causes *in vivo* and is apparent immediately the blood sample has been collected. It is a transient characteristic within the human body, and may be observed in each blood sample collected over a period of days, or for several months. The abnormal condition usually progressively disappears. The cause of this characteristic is unknown; it has been shown to occur in both apparently healthy and unhealthy individuals, and in the unhealthy no particular association other than with some variable infective condition has been noted.

Autoagglutination also results from causes *in vivo*; it too is apparent immediately the blood sample is collected. It is usually associated with disease conditions, particularly acquired hemolytic anemia. Autoagglutination, as the term implies, indicates that the patient's cells will agglutinate in their own serum, such agglutination occurring at room temperature or 37° C.

The purpose of the present communication is to report a case of polyagglutinability of red cells, and to discuss in some detail this condition together with panagglutination and autoagglutination as possible sources of error in blood grouping.

Panagglutination or Bacteriogenic Agglutination.

Wiener (1943) adequately discussed panagglutination or the Hübener-Thomsen phenomenon under the heading of bacteriogenic agglutination. He pointed out that there are phenomena unrelated to isoagglutination resulting from bacterial action, not only dependent on changes in the blood cells, but also due to changes in the test serum used. These phenomena do not occur when uncontaminated blood and uncontaminated serum are used for grouping tests. It is interesting to note that observations on bacteriogenic agglutination date back to 1925. A contaminated testing serum is usually obviously so and should be discarded; but contaminated or panagglutinable blood may show no changes in appearance whatever, or may be only slightly discoloured. In most panagglutinable blood samples seen by one of us (R.T.S.) the cause has been proved to be by either Gram-positive cocci or bacilli, and rarely has any change in the appearance of the blood sample been obvious. These samples have usually been collected in the field in distant places for racial blood grouping, and to avoid mistakes in grouping due to panagglutination, cell samples classed as group AB have been tested in normal group AB serum at room temperature. Samples showing agglutination in this testing reagent have been recorded as panagglutinable and immediately discarded. In thousands of blood samples examined, the frequency of panagglutinable blood has been found to be low. The property of panagglutinability can be transferred to fresh blood samples by the addition of a drop of panagglutinable blood, the phenomenon appearing after the blood has stood for twelve to twenty-four hours at room temperature.

The phenomenon today is generally referred to as the Hübener-Thomsen-Friedenreich phenomenon because Friedenreich made substantial contributions to the early observations. According to him, panagglutination resulted from bacteria producing an enzyme which acted on the red cells, transforming a latent receptor in the erythrocytes into an active agglutinin, which he designated as T. Anti-T agglutinins have been shown to be present in almost all human serum, except that of young infants, so that the enzyme-altered cells react like cells of group AB. Wiener pointed out that this pitfall in blood grouping can be avoided by noting that the cells are also agglutinated by group AB serum, by demonstrating the presence of anti-A or anti-B, or both, isoagglutinins in the patient's serum, or by repeating the tests on a freshly collected blood sample. It is considered that the phenomenon is rarely observed in blood which has been kept in the form of a clot; but it has recently been suggested that in such samples certain blood group antigens may deteriorate rapidly.

A contaminated specimen of serum may show heavy or slight clouding, and may or may not cause abnormal agglutination of red cells. Bacteriogenic agglutination of this type was designated H-agglutination because it was observed in a specimen of serum inoculated with *Corynebacterium H.*

It was considered that the formation of bacteriogenic agglutinins in serum resulted from the transformation of some constituent of a serum by a bacterial product present in filtrates of the cultures. A number of antiseptics which may be added to serum are capable of preventing the appearance of bacteriogenic agglutinins.

Polyagglutination.

The first example of true polyagglutinability of red cells appears to have been recorded in 1938, and occurred in a child aged four years, who had been treated with serum and sulphanilamide because of pneumococcal sepsis after measles. The patient's blood belonged to group O, but was agglutinated by about 15% of normal sera of all groups. The agglutination occurred at room and lower temperatures, but not at 37° C. The characteristic was not evident in blood samples four months later. The phenomenon was thought to resemble the Hübener-Thomsen phenomenon, except that the change from the latent to the T agglutinin had occurred *in vivo*. Subsequently more examples of polyagglutinability have been recorded, and 13 cases of abnormal red cell agglutination have been tabulated by Reepmaker (1952), who has supplied a full bibliography. Stratton (1954) has described six cases of true polyagglutinability, three of which occurred in healthy blood donors, one in a person suffering from hematemesis, one in a person suffering from subacute peritonitis, and the other in a donor having a "cold". Stratton has used the following definition of polyagglutinability: "Polyagglutinability of red cells is a condition in which a person's red cells are agglutinated at room temperature by a variable number of normal sera. This agglutination is absent at body temperature and is independent of ABO blood groups."

It is likely that other cases have been encountered and have not been reported. The condition is of rare occurrence, and the reporting of a case found recently in Australia will serve to remind hematologists that panagglutination, polyagglutination and autoagglutination are possible sources of error in blood grouping.

Autoagglutination.

Autoagglutination, like polyagglutination, results from causes *in vivo*; but here the abnormal behaviour of the erythrocytes is often directly associated with certain diseases—for example, virus pneumonia and acquired hemolytic anemia. The serum of such patients contains single or multiple atypical antibodies which sensitize the patient's own red cells *in vivo*. Autoagglutinable cells are therefore the most frequently encountered of the three types under discussion. They show agglutination varying in strength from case to case, and this agglutination is evident at room temperature, and often at 37° C.

Autoagglutinable cells always agglutinate in their own serum, whereas polyagglutinable cells do not, except at 5° C. in some cases owing to a cold agglutinin. In four of the 13 cases referred by Reepmaker (1952) autoagglutination was present, and these cases therefore appear to differ from those in which uncomplicated polyagglutinability alone has been described.

When cell suspensions of autoagglutinable cells are required, it is recommended that they be prepared by washing the erythrocytes thoroughly several times in saline at 37° C.

Autoagglutinable cells from patients with acquired hemolytic anemia generally give a positive reaction to the anti-globulin (Coombs) test, but polyagglutinable cells fail to react.

Clinical Record.

The patient "S", a female, aged thirty years, was admitted to Wallsend Hospital on October 10, 1954, suffering from persistent uterine hemorrhage and moderately severe pyrexia. The patient was observed for three days, when a blood sample was withdrawn and forwarded to the Royal Newcastle Hospital for grouping and selection of blood for transfusion. It was in this sample of blood that the red cells were found to be polyagglutinable. A blood transfusion of one litre of blood was given to the patient the following

day. A further sample of blood was collected one week later and it showed the same agglutinability. A sample was then sent to the Commonwealth Serum Laboratories for confirmatory tests.

After an operation and pelvic drainage the patient's convalescence was uneventful, and she was discharged from hospital three weeks after admission. Investigation of a further blood sample collected on November 16 showed that the polyagglutinability characteristic had considerably diminished and could no longer be detected at room temperature, but was evident with eight of 14 freshly collected random sera at 5° to 10° C.

A report from the Wallsend Hospital indicated that *Staphylococcus aureus* had been isolated from a blood culture. It is not known whether this finding was significant and whether the organism would render erythrocytes polyagglutinable in laboratory tests.

Investigations.

More complete investigations were performed on both the erythrocytes and the serum from patient "S" when it was discovered that her erythrocytes exhibited polyagglutinability. Tests have been carried out by both the slide and tube techniques. Batches of ABO grouping sera of various ages were available at the Commonwealth Serum Laboratories for this investigation.

Results and Discussion.

Tests on the patient's red cells and serum indicated clearly that she was of group O.

Her erythrocytes showed a low grade of agglutination compared with the normal agglutination obtained when potent ABO testing reagents were used. This weak type of agglutination would indicate to an experienced laboratory worker that something unusual had been encountered; but an inexperienced worker might fail to realize that the agglutination seen was of a false variety, and that there was need for further tests in a central laboratory.

The patient's red cells showed some agglutination with eight group A (anti-B) serum batches, which consisted of pooled selected high-titre sera in general use in Australia. There was slight variation in agglutination strength at 20° C. from batch to batch. Agglutination was strongest at 5° C., and one of the eight serum batches showed weak agglutination with the patient's cells at 37° C. When tests were performed with ABO testing reagents several years old, only a trace of agglutination was obtained, or none at all.

In similar tests with eight group B (anti-A) pooled serum batches the same reactions were obtained as with the group A sera, except that no testing reagent showed any evidence of agglutination with the patient's cells at 37° C.

Tests performed with eight group O (anti-A, anti-B) pooled serum batches gave results as described for the group B sera.

The patient's cells failed to react with three group AB sera at 20° C., but showed weak reactions at 5° C., the strength of which varied according to the age of the serum. Two of these sera were several years old, while one had been collected several months previously.

Three freshly collected maternal sera gave fair agglutination with the patient's cells at 20° C., and two of the three gave a very weak reaction at 37° C. The patient's cells tested against the three corresponding cord sera showed fair agglutination at 5° C., but only trace agglutination at 20° C., which confirms the earlier observations of others that cord sera are lacking in the agglutinins present in adult sera which are active against polyagglutinable red cells.

Tests performed on the patient's serum showed that it contained normal anti-A and anti-B activity, which confirmed the patient as being of group O. No other atypical antibodies were present, and no autoantibodies were detectable at 20° C. At 5° C. the patient's serum gave weak agglutination when tested with her own cells, but other

normal group O cells failed to show any evidence of agglutination at this temperature.

The present case of a group O patient with polyagglutinable cells, and showing the absence of autoagglutination at 20° C., suggests that this case is similar in many ways to the seven group O cases initially described by Levine and Katzin (1938), by Gaffney and Sachs (1943), by Basil-Jones, Sanger and Walsh (1946), by Boorman, Loutit and Steabben (1946) and by Henningsen (1949). Reepmaker (1952), in tabulating 13 cases under the heading of polyagglutinability of red cells, has included cases in which, while abnormal agglutination of red cells was shown, varying degrees of autoagglutination were also exhibited, and thus an autoantibody was present in the patient's serum. It would seem to us that if the term "polyagglutinability" of red cells is worth keeping to describe a particular abnormal characteristic in the patient's blood, then it should be reserved for the type of case as originally described, and not one in which autoantibodies are also present and demonstrable at 20° C. or at 37° C. It might be said that cases of polyagglutinability which fit the original conception of Gaffney and Sachs (1943) are extremely rare, while cases in which autoagglutination is present are comparatively common.

One of us (P.I.A.H.), directly in control of blood bank practice and using fully controlled techniques, has encountered only one case of polyagglutinability during a period of three years in which blood samples from 7000 donors and 4000 recipients have been tested. This observation indicates the rarity of examples of polyagglutinable erythrocytes. It therefore seems unwise to say that additional specific techniques should be observed which would add further burdens to transfusionists without adequate returns. However, at the Royal Newcastle Blood Bank the following procedures are recommended: (i) Blood transfusions should always be preceded by adequate compatibility tests. (ii) In an emergency only group O Rh-negative blood should be used. (iii) All patients found to be of blood group AB should have their serum tested against known control cells of groups A and B. This precaution would help to prevent incorrect ABO grouping due to abnormal agglutinability of the red cells. (iv) Normal AB serum as a control in ABO grouping and Rh typing would best be used to test those cells already classed as group AB.

Reepmaker's own case of polyagglutinability in a group A subject was one in which the abnormal agglutinating characteristic apparently was seen only over a few days. The patient was suffering from a urinary infection, and from the urine was isolated an a haemolytic streptococcus, which possessed the ability to render the patient's red cells panagglutinable in laboratory experiments. He concluded that polyagglutinability of erythrocytes taking place *in vivo* and the Hübener-Thomsen-Friedenreich phenomenon of panagglutination *in vitro* are intimately related, and are most probably identical. The fact that the a haemolytic streptococcus isolated from the urine was capable of rendering the patient's cells panagglutinable could have been due to chance, as any of a number of body organisms—for example, non-pathogenic skin organisms—do, in fact, possess the same ability to initiate panagglutination. Two of the first seven group O cases of polyagglutinability were in healthy children, and in these one must assume that if bacteria or viruses or their enzymes do initiate the process *in vivo*, then these children had suffered with some subacute infection which had passed unnoticed. In three of Stratton's six cases the subjects were healthy blood donors. It seems fair to accept from published data that in panagglutination and polyagglutination the so-called T agglutinin in the erythrocytes and anti-T agglutinins in the serum are common components; but as true polyagglutination is a rarity, and as it may be observed in healthy subjects, it also seems fair to say that the *in-vivo* cause of polyagglutinability has not been established.

Summary.

1. An example of polyagglutinable erythrocytes in a female patient of blood group O has been recorded.

2. Polyagglutination, panagglutination and autoagglutination of red cells have been discussed as possible sources of error in blood grouping.

Acknowledgements.

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PROLAPSED CORD TREATED BY CONTINUOUS MANUAL ELEVATION OF THE HEAD AND CÆSAREAN SECTION.

By J. B. GRAY,
Griffith.

Mrs. A., aged twenty-six years, was admitted to the Griffith District Hospital at 4 p.m. on June 4, 1954, in early labour with her third child. The membranes ruptured at 7.30 p.m. the same evening, and good contractions continued until 11 p.m., when I was notified, as a routine, that the patient was in strong labour and doing well.

At 11.35 p.m. I went to the labour ward in company with the senior resident medical officer to examine the patient, and was informed by the labour ward sister that the cord had prolapsed a few minutes previously.

On examination of the patient, there were about six inches of cord protruding from the vagina and the fetal heart sounds were becoming erratic. The senior resident medical officer and I "scrubbed up" immediately, and a junior resident medical officer was called to administer an anæsthetic. Atropine, penicillin and streptomycin were given immediately, and the operating theatre staff was notified. A hand was inserted into the vagina so that the fingers gripped the fetal head and the cord lay along the palm of the hand and between the fingers so that its pulsations could be felt. In this way pressure could be exerted on the head in an upward direction and compression of the cord prevented. Any relaxation of manual pressure was immediately noticed as a slowing of cord pulsations. Considerable pressure was necessary during contractions in order to prevent compression.

The patient was soon anæsthetized and contractions became less forcible; however, it was found that pressure could be exerted for five to ten minutes only, before the hand became cramped and lost sensation. So with the arrival of a fourth doctor a system of "change-over" was instituted, whereby each person had his hand in the vagina for only five to ten minutes, and was then relieved by another, one hand being slid in as the other was removed. The doctors resting immersed their hands in warm antiseptic solution until their turn came again.

At 12.5 a.m. the patient was transferred to the operating theatre with one of the assistants riding on the trolley and maintaining pressure on the head. The patient was transferred to the operating table and prepared, and at this stage assistants were changed again and the patient was

draped, the assistant being covered by drapes also and still maintaining pressure. A lower segment Cæsarean section was performed and a living infant delivered. The assistant then retired to relieve his cramped muscles, and the operation continued as usual.

After operation a moderately severe post-partum hæmorrhage occurred; however, as transfusion was already in progress this was not troublesome, and apart from some vomiting by the mother, both mother and baby progressed uneventfully.

Shortly after this case another case of prolapsed cord associated with shoulder presentation at thirty-two weeks' gestation occurred; the same treatment was given by one of my colleagues, also with a successful outcome.

Comment.

This case is reported, firstly because a search of the literature does not reveal any mention of this treatment, and secondly because one usually associates a prolapsed cord with a stillbirth. We realize that there are several factors against the use of such treatment, the main ones being infection and risk of uterine rupture. However, we believe that with the use of antibiotics from the outset the risk of infection is minimized, and as far as the risk of rupture is concerned it may be pointed out that delivery is delayed for only thirty minutes, and as the patient is anæsthetized the uterine contractions are much less powerful.

I should also like to point out that for such treatment to be successful, a highly organized and efficient nursing staff, both in the maternity unit and in the operating theatre, is essential; we are fortunate in having such a staff.

Reviews.

The Cerebrospinal Fluid. By S. Lups, M.D., and A. M. F. H. Haan, M.D., with an introduction by Pearce Bailey, M.D.; 1954. Amsterdam: Elsevier Publishing Company, Limited. London: Cleaver-Hume Press, Limited. 9" x 6½", pp. 366, with 93 text figures. Price: 52s. 6d.

No detailed study of the cerebro-spinal fluid has been available in the English language, and anyone in need of information about the pathology of this fluid had to search far for it. The lack has been made good by the publication by S. Lups and A. M. F. H. Haan of a book entitled "The Cerebrospinal Fluid". The first chapter gives a detailed account of the production and properties of the cerebro-spinal fluid. The methods for obtaining samples of the fluid are described at great length. A general account of the composition of the fluid under normal and pathological circumstances is given in 60 pages. The condition of the cerebro-spinal fluid in a number of diseases is set out in 125 pages and in great detail. Finally the microscopic and chemical methods for investigation of the fluid are given fully and there is an extensive bibliography.

This book seems to cover the ground very adequately and the methods for the various tests and the interpretation of the results of the tests are treated very fully. There is a considerable amount of information obtained in the very active Dutch schools which has not been readily available to the English reader. The translation from the Dutch has been done admirably. This is a book which can be recommended highly to anyone interested in the cerebro-spinal fluid whether in normal conditions or in disease states.

Blood Groups in Man. By R. R. Race, Ph.D. (Cambridge), M.R.C.S. (England), F.R.S., and Ruth Sanger, Ph.D. (London), B.Sc. (Sydney), with a foreword by Ronald Fisher, F.R.S.; Second Edition; 1954. Oxford: Blackwell Scientific Publications. 8½" x 6", pp. 416, with 24 text figures. Price: 30s.

"BLOOD GROUPS IN MAN", by R. R. Race and Ruth Sanger, which first appeared in 1950, is now out of print, a pressing reason indeed for the publication of its second edition.

After four years' acquaintance with this book, it would be hard to conceive of a blood group laboratory without its well-worn copy always close at hand, in which to delve

when, as quite often happens, problems arise which prompt us to "Let us see what Race and Sanger say".

The pleasing type and spacing remain as in the first edition, and so does the crisp clarity of expression: what could be more delightfully unexpected and yet such succinct coverage of a rather odd-man-out subject than the concluding sentence in a section on agglutinins in plants: "Though not strictly a plant, a caterpillar has been found to possess agglutinins for cells of group O."

There has, however, been an increase from the concise 290 pages of the first edition to 400 pages in this one. This was inevitable in view of both the large number of new contributions to knowledge of the eight blood group systems described previously, and the recent discovery of a ninth system, which has been called Kidd, with its antigens designated Jk^a and Jk^b. It is obvious that a separate additional chapter must be allocated to Kidd. There is also a new one on the subject of "Linkage", indicating the importance attached by the authors to what they regard as "perhaps the most exciting application of blood groups"—that is, to genetics. Nevertheless they have not neglected more specifically medical aspects, which are given due consideration and appropriate comment.

The second edition of this authoritative and brilliant little book seems as assured of a welcome as its predecessor.

A Manual of Tropical Medicine. By Thomas T. Mackie, M.D., Colonel, M.C., A.U.S. (Retired), George W. Hunter, III, Ph.D., Colonel, M.S.C. U.S.A., and C. Brooke Worth, M.D.; Second Edition; 1954. Philadelphia and London: W. B. Saunders Company, Melbourne: W. Ramsay (Surgical), Limited. 9½" x 6½", pp. 930, with 304 illustrations, seven in colour. Price: £5 14s.

MANY Australian medical officers will remember with gratitude a manual on tropical medicine by the same authors which appeared, all too late, in the last year of the war, and was published by the National Research Council of the United States of America, as a military medical manual.

This former volume, written in concise but instructive style, fully met the needs of service officers. Advances in the knowledge of tropical medicine, particularly in regard to epidemiology, treatment and prevention, have necessitated a thorough revision of the first edition. This new edition, inevitably, has increased by 180 pages; the collaborators have increased from six to twenty-four and include many famous workers in the tropical field.

Notable additions to the text include new chapters on the virus encephalitis, leprosy, leptospirosis, epidemic hemorrhagic fever, heat effects, trachoma, rickettsial pox, trench fever and toxoplasmosis.

There are sections on smallpox (a very necessary inclusion in a work on tropical medicine) and on disease caused by the Coxsackie virus. The Rickettsial diseases are rationally classified and in tabular form are set out their associated pathological and immunological data such as Weil-Felix reaction, complement fixation, rash distribution, primary ulcer, and in addition the characteristic reactions produced in guinea-pig, white rat and white mouse.

The diarrhoeal and dysentery group are dealt with in most adequate fashion; included in the food-poisoning section are very useful tables on the metallic poisons, poisonous foods and bacterial food poisoning.

Few criticisms suggest themselves and these of a minor nature. For example, in the world distribution of disease maps the area shaded for Australia does not always convey the distribution as we know it.

One very valuable feature for the student is the inclusion of a pictorial representation of the essential epidemiology.

The book is well produced and provided with numerous and well-chosen illustrations. It can be confidently recommended to the student, the service medical officer and the busy practitioner as a concise but adequate exposition of modern tropical medicine.

Geriatric Medicine: Medical Care of Later Maturity. Edited by Edward J. Stieglitz, M.S., M.D., F.A.C.P.; Third Edition; 1954. Philadelphia: J. B. Lippincott Company. Sydney: Angus and Robertson, Limited. 10" x 7½", pp. 742, with 205 illustrations. Price: £8 1s. 3d.

A SHORT REVIEW cannot pay adequate tribute to "Geriatric Medicine" edited by Stieglitz. Commencing with a statement of normal anatomical and physiological changes in "normal senescence", to each of which basic studies a full chapter is devoted, the book then proceeds systematically to discuss in full text-book style the diseases characteristic of

old age. Suffice it to say that the subject is of increasing interest of recent years. It is handled in keeping with the best tradition of medical literature and the material is presented in a handsome though expensive volume printed on art paper, well indexed, and carrying at the end of each chapter a necessary and apparently full bibliography.

Stieglitz's own chapters on the foundations and on the principles of geriatric medicine are perhaps the best in the book. Students of gerontology will agree with the outline of psychical and mental changes in old age.

Whilst it is agreed that elderly workers are slower in action and more easily fatigued than those younger in age, yet there are compensatory advantages which should make them of value in the labour market. Chief of these are their thoroughness, sense of responsibility and dependability.

The medical care of the normal aged is given due prominence, and community measures are indicated for combating the loneliness and sense of superfluity which depress many old people and spoil their closing years.

As the proportion of aging people in our community increases, our knowledge of the indications for and contraindications against surgical operations on elderly patients must become sounder. It is stated that these are the same for the old as for the young, but that age and apparent infirmities should not serve as excuses to deprive the elderly patients of appropriate treatment. As a matter of fact, the experience in Australia leads one to believe that elderly patients stand even big operations surprisingly well.

The secret of success lies in scrupulously careful preparation for operation and intelligent management of convalescence. As with the young, so with the old, operations should be deferred if kidney function or haemoglobin level is defective. Early mobility should be the post-operative goal to diminish pulmonary congestion and vascular accidents. It is interesting to note consistent reasoning in connexion with the treatment of coronary occlusion. The modern view is adhered to, namely, that for the same reasons the aged should not be kept in bed for the conventional four weeks unless the infarction is gross. An additional reason not stated is the fear of joint complications which often follow immobilization of the aged.

Incidentally, not every physician will agree with the suggestion that nitroglycerin should not be used in angina because it will lower blood pressure to the point of predisposing to acute myocardial infarction. The widespread use of nitrites in this country indicates that physicians have not found them dangerous. Furthermore, the more slowly acting dilators which the author prefers, for example, theophyllin ethylene diamine, are often very disappointing.

The chapter on gout is the best account of this malady and its treatment we have ever read.

This work is a third edition, but is really a new work, for the authors have kept abreast of the times. "Geriatric Medicine" should be read and studied by all physicians and surgeons.

The Year Book of Radiology (1954-1955 Year Book Series). Radiologic Diagnosis, edited by John Floyd Holt, M.D., and Fred Jenne Hodges, M.D.; Radiation Therapy, edited by Harold W. Jacox, M.D., and Morton M. Kligerman, M.D.; 1954. Chicago: The Year Book Publishers, Incorporated. 9" x 6", pp. 432, with 348 illustrations. Price: \$9.00.

THIS "Year Book of Radiology" is the 1954-1955 series of this work. An interesting foreword on radiology in the Scandinavian countries describes the great interest in this work in that part of the world. Large departments with most lavish equipment are the rule. Great encouragement is given to research workers and the young radiologists receive a most intensive training. The author was struck by the way in which workers continue working late into the evening in order to complete and file the day's films. The method of storing films is unusual; they are filed under the year of birth, followed by the month and day, and not by serial numbers as elsewhere. It seems to be quite satisfactory. In the section on technique there has not been much change. The use of high voltage in chest work is not very convincing. A motor changing device using rolled film and a single set of intensifying screens may prove of value. The electronic amplifier for brightening the screen image shows some advance and is being used in cinematography. One author reports a new sign in Addison's disease—ossification of the aural cartilage. Interesting cases are reported in all sections and the illustrations should be of great help. A new method of demonstrating the acetabular margin is described. It is an oblique view with the affected

side furthest from the film. Good films of some cases of hydatid disease of bone are featured by Latham, of Cape Town. Angiography in chest practice continues to show advance and tomography is becoming more popular in chest work. A great deal of new work is reported in studies of the gastro-intestinal tract. The illustrations in this section and in studies of the biliary and renal tracts are excellent. In radiation therapy higher degrees of energy with rotation techniques and precision methods of dosage measurements have been in use and stress is being laid on the more accurate localization of tumours before treatment. The use of Cobalt-60 is becoming more popular, and various "sensitizers" such as nitrogen mustard are being combined with the radiation exposures. Some workers report good results in radiation of the spine in arthritis and in local application in Dupuytren's contraction. A great deal of this section on therapy is devoted to physics and dosimetric methods.

The book is well worth close study by all radiologists and the excellent illustrations should prove of greatest help.

The Care of the Aged (Geriatrics). By Malford W. Thewlis, M.D.; Sixth Edition; 1954. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical), Limited. 9½" x 7", pp. 332, with 155 illustrations. Price: £7 17s. 6d.

THIS book should be of interest to Australian general practitioners. The author believes that "Geriatrics is not a special branch of medicine. . . . There seems to be no reason to make it a speciality". In other words, he believes that the care of the aged should remain with the family doctor.

This is a large book, but if it is considered in two parts, it becomes possible for the busy practitioner to use it to advantage. The first portion (230 pages) deals with the general approach to the problems of old age. Sociological and preventive aspects are well handled. This section should be read carefully by all doctors. It is a valuable contribution to our better understanding of the problems which face us, both now and in the future. The second part discusses in detail the diseases found in older patients. It is a textbook of medicine with emphasis on the later years of life, and should be used as a reference book when particular problems are encountered.

Some of the material in this book will appear strange to the Australian reader. In discussing "Health Protective Examinations", the author outlines a programme which is so extensive that, as he warns, there is a real risk of damaging frail old people by too much enthusiasm for investigation. There is a chapter on "Pre-clinical Medicine" which is defined as "the treatment of disease before visible manifestations can be detected", so that "through a study of pre-clinical states a synthetic diagnosis is obtained, an analysis of disease tendencies is made and probabilities are weighed".

Despite this occasional "tyranny of words" a feature of the book is the author's clarity of style. There is a mass of detailed information available here which has taken thirty-five years of patient endeavour to assemble.

All through this book the personality of the author shows forth in a very pleasant manner. It is obvious that he has a humanitarian outlook and that his patients do not suffer from his attentions. Rather does he seem to invite them to "grow old along with me. The best is yet to be. The last of life for which the first was made".

Hematological Technique for Medical Laboratory Technicians and Medical Students. By E. M. Darmady, M.A., M.D. (Camb.), F.R.C.P., and S. G. T. Davenport, F.I.M.L.T.; 1954. London: J. and A. Churchill, Limited. 10" x 6½", pp. 206, with 27 illustrations, four in colour. Price: 18s.

THE reason given by the authors for the publication of this book is that they have felt there was a need for a book suitable for instructors responsible for the training of medical laboratory technicians. The authors aim at covering the hematological section of the Syllabus of the (British) Institute of Medical Technology, and at giving the technician brief explanations of the theoretical background of his practical work. It would seem that compactness and a relatively low cost have also been kept in mind.

In dealing with technical procedures the authors are on sure ground; clear and systematic accounts are given of the various methods selected for inclusion. An interesting and useful feature is the summary of its advantages and disadvantages at the end of the description of each method. The content of these appraisals suggests that the authors' well-balanced judgements are based on much personal experience.

They are less uniformly successful in their attempt to include in a book of this type a presentation of theoretical considerations. If for no other reason than the limited space available, the subject matter has mostly been so condensed as to be inevitably sometimes over-dogmatic or obscure.

Several apparent typographical errors were noticed in the text (for example, the name "Sabin" is misspelt "Savin"). There is a statement, "Fetal hemoglobin . . . is formed only in the new born child", which in its context would be correct if it read ". . . is found in . . .".

Even if deliberately done, the omission of descriptions of blood group tests and cross-matching of blood for transfusions from a book on hematological technique is unusual, as most qualified technicians working in this field will sooner or later be required to know how to set up these tests.

Techniques in Clinical Chemistry: A Handbook for Medical Laboratory Technicians. By Frederick N. Bullock, F.I.M.L.T., F.R.M.S., F.C.S.; 1954. Bristol: John Wright and Sons, Limited. 9" x 6", pp. 180, with seven text figures. Price: 16s. 6d.

THIS is a book by a hospital laboratory technician who had the responsibility of teaching student technicians. Consequently it considers a limited selection of methods and explains them without sending the reader to original literature. This economical use of the space available has resulted in a very well-written precise "practical" book. It is assumed that the hospital library will contain the large compendia which have been written on this subject.

The book is divided into eight sections which deal with volumetric analysis, cleaning, collection of specimens, blood, cerebro-spinal fluid, faeces, gastric analysis, urine, and renal and hepatic function. There is a useful appendix on calibration of glassware, specifications for pipettes and burettes, information on accuracy of flasks, and sundry tables. The book is well indexed and very well produced. Even though different laboratories may differ with the author as to preferred methods, one may recommend this book unreservedly for biochemical technicians in training.

Local Analgesia: Brachial Plexus. By R. R. Macintosh, M.A., D.M., F.R.C.S., F.F.A.R.C.S., D.A., M.D. (hon. causa) (Buenos Aires and Aix-Marseille), and William W. Mushin, M.A., M.B., B.S. (London), M.R.C.S., F.F.A.R.C.S., D.A.; Third Edition; 1954. Edinburgh and London: E. and S. Livingstone. 7½" x 5", pp. 62, with 32 illustrations. Price: 10s. 6d.

THIS booklet sets out the indications for brachial plexus block—the patient's fear of losing consciousness, the desirability of preserving ambulation, prolonged setting and screening of a fracture, the treatment of robust patients especially after much food or drink, tendon suture or tendolysis with preservation of movement during the operation, and lack of an anaesthetist.

The technique of Patrick is fully and clearly described, chiefly by the aid of clear and accurate diagrams, beautifully produced, on art paper.

Some will look askance at the authors' unreserved praise of xylocaine, because cases have occurred in which a patch of anaesthesia has persisted in one case for two months after operation under xylocaine, and in another case for twelve months.

The authors countenance the omission of sterile gloves for the operator, but they fail to point out that when gloves are omitted the instruments should be handled dry.

They trace the history of Horner's syndrome back to 1839, but Winslow, in 1732, credited Petit with its description.

The booklet can be strongly recommended.

Childbirth: Theory and Practical Training. By Marjorie F. Chappell, D.N. (London), S.R.N., C.S.P., S.C.M., H.V. Cert. with a foreword by C. Keith Vartan, F.R.C.S., F.R.C.O.G.; 1954. Edinburgh and London: E. and S. Livingstone, Limited. 7½" x 5", pp. 136, with 35 illustrations. Price: 7s. 6d.

THIS book is the work of an enthusiast and is an ideal book for anyone about to commence classes for ante-natal instruction. It contains a wealth of detail, both in the organization of such classes and also in the subject matter of the lectures to be given to the mothers.

The author considers it desirable to hold eight to ten classes for each group, preferably in the last month or two of pregnancy. She also considers it a good thing for the mothers who are to be confined in hospital to be taken over

that hospital some time during their pregnancy and made conversant with the routine through which they will go on their admission.

During the lectures use is made of a model of the uterus, a pelvis and a "Birth Atlas". Instruction is given in relaxation and controlled respiration, great stress being laid on the importance of the latter. Exercises designed to stretch the muscles of the pelvic floor are described. The book contains some excellent diagrams, including those of post-natal exercises.

This is essentially a book for a doctor who would be supervising a scheme for antenatal instruction, or for a physiotherapist who is interested in the obstetrical angle of her work, and should be of great value to them. It is not a book for the expectant mother herself to read.

Die Krankheiten der endokrinen Drüsen: Unter Berücksichtigung ihrer Anatomie und Physiologie. By Herman Zondek; 1953. Basel: Benno Schwabe and Company. 9½" x 7", pp. 814, with 175 illustrations. Price: 72 francs (Swiss).

Few people in the world will have the experience of H. Zondek to deal in an authoritative way with the whole of the vast and still expanding field of endocrinology. The rapid increase of knowledge in this field necessarily out-modes a text-book in certain points rather soon, but up till the date of its publication this book of 800 pages gives the interested reader a vast amount of well-arranged detailed information on the physiology, pathology, diagnosis and treatment of the hormonal disturbances. The excellent descriptions of the clinical conditions, many of which are enlivened by personal observations, are an outstanding feature of this book and will not be easily replaced by better ones. It is a pity that the numerous illustrations are not up to the standard of the text. One gets the impression that in most cases this is more due to the technique of reproduction than to the poor quality of the originals.

In a book of this kind it is only natural to find certain opinions to which others will not subscribe, while minor omissions will be present. A good many, for instance, will not follow Zondek in his conception of the so-called "status thymico-lymphaticus". The pregnancy test using the hypophysectomized frog (*Rana esculenta*) is not mentioned.

A few more of such minor criticisms could be added. They, however, detract but little from the great value this book must have for anyone interested in this particular field of medicine.

Oral Cancer. By J. Roy Bourgoynne, B.S., D.D.S., with chapters by David S. Carroll, M.D., and Ralph S. Lloyd, D.D.S.; 1954. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson, Limited. 9½" x 6", pp. 296, with 18 illustrations. Price: 70s.

This publication contains a lot of interesting information, much of which, however, is well known to medical and dental students in Australia. For example, the table of tumours on page 79 is the type of information which is usually given in undergraduate lectures.

The arrangement of the various sections of the publication is rather unusual; for example, leucoplakia and *Nichen planus* follow metastasis of cancer, then comes malignant tumours of the salivary glands, followed by diet for cancer patients. The chapter on maxillo-facial prosthetics in patients with cancer contains interesting and helpful information, especially about some protective appliances used in radiation therapy.

It is hard to understand why a glossary is needed in a book such as this, but no doubt the author feels it is necessary for a certain section of his readers.

This volume is difficult to assess for review purposes—it is a sincere effort, but the arrangement and exposition are at times not a little confusing to the reader.

Australia in the War of 1939-1945: Series 2, Air; Volume 2. Air War Against Germany and Italy, 1939-1945. By John Herington; 1954. Canberra: Australian War Memorial. Obtainable at all booksellers. 9½" x 6", pp. 748, with 89 illustrations. Price: 25s.

This book is part of the "Australia in the War of 1939-1945" series, and is one of the four volumes of that series devoted to the part played by the Royal Australian Air Force. It tells in very considerable detail of the activities of Aus-

tralian airmen in England, the Middle East, North Africa and Italy. The story starts in the early days when in 1939 Australia had only one complete squadron in action (No. 10 Squadron of Sunderlands), but some 400 members scattered through many Royal Air Force units, and moves through the Battle of Britain, the Middle East and Western Desert, Tunisia, Sicily, Italy and the bomber raids on Germany. By 1943 the number of Australians engaged in this part of the air war had grown to about 15,000. Some of them formed eighteen Australian squadrons, and the rest were found in almost every squadron of the Royal Air Force. It has been necessary therefore to give a picture of the whole air campaign against Germany and Italy, including the over-all policy. But the story is enlivened by details of the experiences of many individual Australian pilots and crews. The author has obviously drawn very largely from squadron intelligence reports and the combat reports of pilots, and often quotes directly from these.

The book is not a novel. It is a history, and a detailed one, but a history that deals not only with policy and broad movement, but with the performances and heroism of individuals. There will be many who took part in these campaigns, as aircrew, groundstaff or medical officers, who will want to read this book. It is full of familiar places and actions and people.

Rheumatic Fever. By Lowell A. Rantz; 1954. Chicago: The Year Book Publishers, Incorporated. 8" x 5½", pp. 36. Price: \$9.00 per annum (12 titles).

We have received from the Year Book Publishers, Incorporated, the first of the "Disease-A-Month Series", which is to consist of monthly clinical monographs on current medical problems. This first monograph deals with rheumatic fever. Its author, Lowell A. Rantz, is an experienced physician who has for years been interested in the problems of streptococcal infection and rheumatic fever and has carried out important original studies in this field. In this monograph he describes the aetiology, natural history, recognition and treatment (including prophylactic measures) of rheumatic fever, especially in the light of recent work and thought. A remarkable amount of information is packed into a brief compass, but the busy physician need not fear that he will be bogged down in academic and speculative detail. The writing is readable and to the point, and likely to appeal to the clinician who wishes to keep up to date despite the pressure of practice. The format of the monograph is attractive and suited to its purpose.

Notes on Books, Current Journals and New Appliances.

Family Doctor. Published monthly by the proprietors, the British Medical Association, Tavistock Square, London, E.C.1. Sole agents for Australia and New Zealand: Gordon and Gotch (Australia), Limited. Subscription for twelve months: 20s. (sterling), including postage.

The emphasis in *Family Doctor* is on the family, and it is evident from such regular features as the answers to questions and readers' letters that many of its most ardent followers are those who are bringing up families. For them there is always included a great deal of sensible advice on the positive side of their children's health and well-being, ranging from psychology to cooking. Indeed, this sort of advice finds a much larger place in the make-up of this popular medical magazine than articles about ill health; and family doctors who put it into the hands of their patients will find it an acceptable representative of themselves in guiding parents about the innumerable details of bringing up a healthy family. The March, 1955, issue, in addition to the regular features, has interesting articles on plastic surgery, detergents, looking after the feet, heart disease (by Walter C. Alvarez), choosing a doctor, how to get more sleep, four rules for speaking freely, common sense about children's bowels (by Professor R. S. Illingworth), the child in hospital and many other things that will interest various members of the family. The general production is as attractive as usual, and a free enclosed booklet advises those who want to slim safely.

The Medical Journal of Australia

SATURDAY, MAY 14, 1955.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

HEALTH EDUCATION OF THE PUBLIC.

Health and good estate of body are above all gold, and a strong body above infinite wealth.

—ECCLESIASTICUS XXX : 15.

The health education seminar held at Canberra in January of this year and reported in the present issue was an event which should attract the attention of all members of the medical profession. The words "health education of the public" come readily to the lips of many persons who apparently think that by talking about such education it is done. The maintenance of health, as a matter of fact, is a complex job. Some people are naturally healthy and live in healthy surroundings; their work is congenial and carries no hazards to their well-being. These people are fortunate, but even they have to adopt certain habits and observe certain rules. They are the exemplars of what has well been called *rude health* and have to learn what is good for them and what is bad. They may do this by trial and error, but the error can, and should, be avoided, lest some permanent damage result. If people of this kind need to be taught, how much greater is the need of those not so endowed with well-being? Health is like a jewel with many facets, and each of these facets has to be kept bright and shining; undue attention must not be paid to one facet, for this would detract from the general lustre. There has to be some coordination about the polishing business. The coordinator in the matter of health must be represented by the profession of medicine. This is of fundamental importance, and this importance has to be realized by everyone concerned, and not least by the members of the medical profession themselves.

As pointed out in the introduction to our report on the Canberra seminar, the meeting was organized by the Commonwealth Department of Health in conjunction with State health departments and the World Health Organization. The most notable feature about the representation of these bodies is that the World Health Organization did not send a medical representative to the gathering. It is probably true that the two representatives sent by the World Health Organization work under medical direction, but the absence of a medical representative from WHO was a poor compliment to the Commonwealth Department of Health and to the occasion. In his opening remarks the Director-General of Health, Dr. A. J. Metcalfe, pointed out that health education of the public was not the sole responsibility of the medical profession, but was shared by members of other professions and callings. The lists of those attending the seminar have been published together with their designations in order that the wide field to be covered by the educational process shall be realized.

Miss A. Helen Martikainen, one of the publicity officers of the World Health Organization, did well to insist that the real essence of health education was working with people, to help them to achieve health by their own efforts. This, she pointed out, required a personal approach, and we know that this personal approach is the basis of work carried out by the departments of health in maternal and health services, school health programmes and so on. Medical practitioners know that a good deal of work of this kind is carried out in the several States by the health departments. It will also be considered that the departments are, in many fields of their endeavour, starved for lack of proper staff or for proper facilities to pay suitable staff. It is probably correct to say that if the education departments in the several States were provided with additional staff members and the means of paying them, the work of the inspection and the regular examination of school children could be more than doubled. We have no doubt whatever that much the same kind of statement might be made by those who control the maternal and child health services in the States. In all public health work, and particularly in inspection and examination of school children, success is assured if the persons concerned (the parents in the case of school children) are made to realize the object of what is done and the fact that nothing but good can come from it. One of the reasons why the dissemination of literature and the publication of health journals for the people are not more successful is that the approach is not really personal. If it is possible to appeal to the imagination, as is done in that interesting British Medical Association publication, *Family Doctor*, results may be expected. The unfortunate part is that it is not possible to gauge the extent of results that are obtained. In many centres of Australia an "annual health week" is held, but it is impossible to discover what good results from the happening. Health week, in the words of the definition quoted by Miss Martikainen, "is concerned with change in the knowledge, feelings and behaviour of people". In its most usual form, education in health week concentrates on developing "such health practices as are believed to bring about the best possible state of well-being".

There remains for consideration the good which this recent seminar is likely to do. In the first place, it may give a stimulus to heads of health departments in the several States to increase their cooperation with one another and with the Commonwealth Department of Health in the provision of means which will attract the attention of members of the community and make them interested in health as a desirable objective. Secondly, it may stimulate members of the medical and other professions to further action. It has been said with truth that every medical practitioner practises preventive medicine every day of his professional life. The practitioner, however, needs to do more than this. He needs to see himself as part of an organized movement to teach people what self-help means in the prevention of disease. The fourteen medical persons who attended the recent seminar resolved that although general medical practitioners had abundant opportunities of selfless service in the field of medical education and should be encouraged to maintain and improve the quality of their service, each State Council of the British Medical Association should be asked to examine the need for a health education organization on which the profession should be adequately represented. The group also suggested that sections of preventive medicine should be set up by each Branch Council where they do not already exist and that they should be strengthened where they do exist. It was thought that these sections should examine the subject of health education with particular reference to undergraduate training, post-graduate training and an increased liaison between the various groups interested in health education. We understand that one member of the group undertook to communicate with the several Branch Councils. If this is done, we may expect the Branch Councils to send the matter on to the Federal Council. In the last section of our report of the meeting it will be noted that the various professional groups made their own recommendations. Some of these sound like pious resolutions, but it is to be hoped that this is not so and that some action similar to that envisaged by the medical group will take place. The observation was made at the beginning of this discussion that the coordination of medical education, in other words, its direction, should be in the hands of the medical profession. It is not necessary to create a new professional medical educator who can at best be a trained publicity officer. Publicity officers are experts in their own field and everyone will acknowledge this, but they can never have the fundamental knowledge or the breadth of outlook that can be acquired by a medically qualified person who devotes his whole attention to the subject. Similarly, we must admit that few medically trained persons are good publicity experts. Here is another sphere where close liaison should exist.

Current Comment.

INSIDE SAFETY FOR MOTOR-CARS.

HORACE E. CAMPBELL,¹ in a crisp and caustic article entitled "Deceleration, Highway Mortality and the Motor Car", explains how the occupants are thrown about when

a car is brought to a sudden stop, and forcefully advocates seat belts as the means of preventing injury and deaths. This is worth serious consideration. When a car travelling at 30 miles per hour strikes a solid object and crushes to a stop within a distance of two feet, its deceleration is fifteen times the acceleration due to gravity, or 15G. But the car's occupant, also travelling at 30 miles per hour, is thrown forward, strikes the dashboard, and crushes to a stop in a distance of about two inches, which represents a deceleration of some 180G. However, when the car comes to a violent stop, if its occupant stops with it, he has to survive a deceleration of only 15G, which is comparatively little; he has every chance of escaping an injury. Campbell points out that a safety belt would hold the occupant and achieve the desired result. If the usual aircraft type of lap or thigh belt were used, it would need to be attached to the chassis or to a specially built-in cross member, and the seats would need to be redesigned so that it would grip efficiently and comfortably. At high speeds the lap belt is not so effective—the occupant is whipped forward with severe strain on the hip joints; if the belt is loosely applied there may be injury to the legs, spine or a viscus, and the whipping forward may let the face strike the dashboard or the back of the front seat. Actually, a chest belt with shoulder harness is the only completely effective type of safety belt.

This, however, brings us to the question of whether people in motor-cars would wear safety belts. What people demand and pay heavily for is ample comfort in their own car. Safety belts, especially shoulder harness, are far from comfortable—indeed, considering how aircraft passengers have to be inspected and reminded, and often sternly ordered by the hostess to adjust their belts, and how eagerly they release them at every opportunity, the chances of belts' being used by car passengers are probably very few. Despite their undoubted value, they have the great defect that whether they would be used or not would be entirely at the discretion of the car occupants. It is a safe prediction that if they were offered as optional extra equipment, not more than one car buyer in five would take them, and three out of every five of those would discard them very shortly. Robert G. Livingstone² in "Automobile Collision Injuries", offers an analysis of non-fatal injuries arising from automobile collisions in which inability of the occupant to control his motion in relation to that of the automobile is emphasized in most instances. He advocates seat belts, but remarks that they have yet to find wide acceptance. Fletcher D. Woodward³ has also advocated them; but, sad to say, there is, in his article, "Medical Criticism of Modern Automotive Engineering", strong collateral evidence that obvious safety measures that are left to the discretion of the motorist are unlikely to be observed—his fourth class of common motor-car injuries covers damage to the projecting elbows of drivers. Driving with the arm resting on the window and the elbow projecting is not only universally recognized as being unsafe from the point of view of possible injury, but is also notoriously misleading to other motorists because it so often gives the impression of being a badly made traffic signal. Yet about two out of five drivers do it. It is heartening to find, however, that many of Woodward's suggestions made in 1948 are now to be found in some stock models; in particular, some English cars now have the windows so arranged that it is distinctly uncomfortable to drive with the arm resting on them. This is likely to be the only really successful method of securing safety—the incorporating of safety devices which must be accepted by car users without any option. Livingstone found that the principal source of impact injuries, as distinct from whiplash and wrenching injuries and from being flung forward against the dashboard or steering wheel, was the side of the car, where projections do the damage. The substitution of recessed push-buttons for large hooked door handles is a real improvement. Some English cars have lately abandoned the winding handle for side windows; the glass is counterbalanced, and a small projecting flange allows it to be raised or lowered easily and rapidly. There is a double benefit here; not

¹ *Surgery*, December, 1954.

² *J.A.M.A.*, October 30, 1948.

³ *Surgery*, December, 1954.

only is the dangerous inside projection of a crank and knob eliminated, but in driving rain the window can safely be kept raised, since it can instantaneously be flipped down to allow of making hand signals. Another necessary device is the installation of crash pads on the dashboard and on the back of the front seat.

With all these suggestions it is strange that none of these writers has mentioned backward-facing seats. The reversed seat with a headrest has been recommended in aircraft because there abnormal impact invariably comes from the front, and its effect would merely be to force the passenger deeply into the cushions without whipping or wrenching or throwing him about. It is obvious that backward-facing seats are likely to become normal in aircraft in the very near future. Once that happens, but probably not until then, serious consideration is likely to be given to their use in motor-cars. In a motor-car, although impacts can come from any direction, head-on collisions account for almost all the more serious accident injuries, and backward-facing seats for all passengers would offer maximum safety on the greatest number of occasions. They would at least have the advantage over seat belts that passengers would have no choice but to use them.

GALEN AND THE HUMAN HAND.

"HELP, Hands, for I have no Lands"; so wrote Benjamin Franklin in "Poor Richard's Almanack" in 1758. Amongst those who would have considered the appeal happily addressed, had he not chanced to live sixteen centuries too early to be acquainted with that astute philosopher, Galen may be counted. In his treatise "*De usu partium*" he paid particular attention to the human hand. E. Rist¹ has provided us with some interesting quotations from that work, as well as some relevant comments. He begins by reminding us that Galen, like Plato and Aristotle, believed that the human soul was only a pale reflection of that of the All-Powerful Creator and Keeper of the Universe. Everything in Nature, and in the human body, has been designed and made with such wisdom as to cause Galen to be lost in admiration. He has much to say from this point of view about every part of the body; but he deals first with the hand, and it is with this member that we are concerned here. Galen affirms first of all that the body is the instrument of the soul, and that is why the limbs of different animals have different forms—animals have different souls. Some have weapons of defence, others have limbs well adapted to flight. Man is the only divine being on earth, and has been given by the Creator, as his sole weapon of defence, his hands. They are the tools needed for all industries, and they are equally useful in peace and in war. There was no need to provide man with a horn, when with his hands he could wield a much better weapon than a horn. What does it matter that the lion is faster than man? Man with his hands has conquered the horse, which is faster than the lion; from his horse he can slay the lion at his feet. If man had a horn attached to his hands, he would not be able to use them to build houses or ramparts, or to make a lance or a cuirass or anything else of the kind. With his two hands man can weave a cloak, knot the meshes of a snare, or fashion a net. He is thus the master, not only of animals living on the earth, but also of the inhabitants of the sea and the air. But man is made for peace as well as for war. With his hands he writes laws, erects to God altars and statues, builds ships, fashions a flute or a lyre, forges a knife or a pair of tongs, produces the instruments required in all the arts, and writes accounts of the theory of the arts. Thus man is the wisest of animals, and the hands are fitting instruments for a wise being. Man is not the wisest of animals because he has hands, as Anaxagoras maintained, but he has hands because he is the wisest, as Aristotle declared.

Rist comments that all through this work Galen appears as a firm supporter of Aristotle's doctrine of final causes. He even goes further than Aristotle, whom he takes to

task for having failed to appreciate some particularly apt arrangement of Nature. Galen, to whom the hand was of special interest, describes its anatomy in the greatest detail, having made a series of dissections of the Barbary ape, and puts to himself a number of questions which he proceeds to answer. To the question "Why five fingers?" he replies along the following lines. If the fingers had been fewer in number, they would have been able to carry out most of their functions less perfectly. On the other hand, a greater number of fingers would obviously be superfluous, and Nature never does anything superfluous; she takes equal care never to provide too little of anything. The loss of a finger makes the act of picking up difficult; an extra finger is a hindrance. Galen puts every muscle, every tendon, every bone, every joint, to the test of ultimate wisdom, and proves that for each of these structures the Creator has achieved perfection.

In a leading article in this journal in 1952¹ we made the following statement:

Looked at from the anatomist's point of view, the hand has an intricate and delicate architecture. Careful dissection reveals a wealth of joints, synovial membranes and tendinous insertions that suggests not only prehensile strength but also a considerable variety of movements. The strength and most of the movements depend, of course, on the muscles of the forearm, on their innervation and on their healthy development; but without the elaborate structure of the hand itself nothing like an "instrument of precision" could be developed.

Indeed the hand may become a most delicate instrument of precision, and it has learned skills that would have been far beyond even Galen's imaginings.

POTASSIUM METABOLISM IN GASTRO-ENTERITIS.

POTASSIUM DEPLETION was first recognized by Darrow in 1946 as being associated with infantile gastro-enteritis and subsequent work has confirmed this. D. A. K. Black² has pointed out that potassium depletion has been demonstrated in pyloric stenosis, gastro-enteritis, ulcerative colitis, and steatorrhea, and even as the result of long use and abuse of laxatives. When the disease necessitates surgical intervention, further losses of potassium occur. Severe potassium depletion can cause muscular weakness, respiratory distress, renal and cardiac damage, anorexia and even paralytic ileus.

B. Schlesinger, W. Payne and J. Black³ draw particular attention to the association of abdominal distension and paralytic ileus in infants with gastro-enteritis and the relation between these conditions and a reduced potassium content in the blood. They have examined 653 infants with gastro-enteritis admitted to a special unit at the Hospital for Sick Children, Great Ormond Street, London. Serum potassium levels were estimated in all severe cases as a guide to subsequent treatment. Very many of the infants who were dehydrated were found to have hyperkalemia, and hypokalemia developed only when dehydration had been rectified. The authors recognized three types of hypokalemia—severe, with an average serum potassium content of 10.7 milligrammes per 100 millilitres, the normal being taken as 16 to 22 milligrammes per 100 millilitres; moderately severe, with an average serum potassium content of 11.5 milligrammes per 100 millilitres; and mild, with an average serum potassium content of 15.3 milligrammes per 100 millilitres. In the severe type paralytic ileus with distension was present. The infant, already very ill, became enormously distended. There was no organic intestinal obstruction in any case. In the moderately severe type distension was present but no ileus, and the degree and duration of the distension varied greatly. In the mild type there was transient distension only. Analysis of the blood chemistry in the 653 cases showed that hypokalemia was present in 67 and was associated with distension in 37. The appearance of

¹ M. J. AUSTRALIA, September 6, 1952.

² Proc. Nutrition Soc., 1955, Volume XIV, Number 1.

³ Quart. J. Med., January, 1955.

¹ Presse méd., February 19, 1955.

hypokalaemia seemed to be related to the severity and duration of the diarrhoea. Abdominal distension was seen to follow soon after low serum potassium levels were reached, but occasionally remained for some days after the content had risen to normal. It seems that abdominal distension in gastro-enteritis (and with it the risk of ileus) is the direct result of potassium depletion, particularly when the depletion has been heavy and prolonged.

In the treatment additional potassium should never be given to dehydrated infants with gastro-enteritis except in the small quantities contained in Hartmann's solution and human plasma. When rehydration has been established one to two grammes of potassium chloride may be given orally or half to one gramme in the fluids given intravenously, depending on the degree of hypokalaemia. Potassium may be given prophylactically to all severely ill infants for four or five days, as soon as dehydration has been overcome. If hypokalaemia can be avoided abdominal distension and ileus are unlikely to occur. The mechanism of the distension during hypokalaemia is not very clear, but there is good reason to believe that in severe gastro-enteritis the deficit of potassium is in the muscle cells and that the distension or ileus results from this deficit rather than from hypokalaemia alone. This would explain why the complication often persisted for some days after the serum potassium level had returned to normal.

MASS INOCULATIONS BY JET INJECTION.

MORE and more frequently nowadays the need arises for administering injections to large numbers of people in the shortest convenient time. Earthquakes or widespread floods, for example, might initiate a need for general anti-typhoid vaccination, while in time of war many occasions arise on which there is urgent need for a fast method of giving long series of injections. A well-trained and coordinated team, with pre-loading of syringes, can give many injections over long periods, but the team must be large and it needs a lot of equipment. Under ordinary circumstances the resources of quite a large hospital would be strained to maintain a rate of over 30 patients per hour for each of several operators for very long, and such a rate is far too slow if a serious emergency exists. The feasibility of giving percutaneous injections by means of a small jet at high pressure has been recognized for many years, but the earlier devices were clumsy and unreliable. Now, however, the United States Army Medical Service Graduate School has developed a compact portable electric unit needing only one operator, who can give injections by pulling a trigger, as fast as the patients can be presented to him, with only short pauses to reload after each 50 millilitres has been used. This machine is described in full detail by J. Warren, F. A. Ziherl, A. W. Kish and L. A. Ziherl¹ in their article entitled "Large-Scale Administration of Vaccines by Means of an Automatic Jet Injection Syringe". During the experimental work leading to the development of the machine, standards were determined, of which the chief are that the jet orifice should not be greater in diameter than 0.008 inch (optimum 0.005 inch), the pressure used should not be greater than 300 pounds per square inch (optimum 280 pounds) and the jet must be kept still during firing to avoid laceration of the skin. Only hypodermic injection is possible; suspensions of particulate matter such as penicillin-aluminium-monostearate combinations cause trauma; viscous and oily suspensions do not readily penetrate the skin; and there is often slightly more bleeding, erythema and transient oedema than occur with needle injections. Pain is less than with needle injections; the risk of transmission of malaria or virus hepatitis is removed; accurate doses are delivered automatically, in any desired volume between 0.25 and 1.0 millilitre; and mechanical failures are few—the most important, failure to penetrate, which sometimes happens in persons with thick, tough skin, is immediately detectable, and the injection

can be repeated at a more suitable site. A hand-operated single-shot jet syringe has also been developed for the use of diabetics and for clinical use, but it is not nearly so capable of being efficiently loaded. It is questionable whether this manual device would be superior in any way to a standard syringe; but there can be no question that the automatic multiple-dose jet injector, since it so efficiently meets the requirements of speed, simplicity and accuracy, could prove of great value in mass injection projects.

CHLOROQUINE AND EMETINE.

IN these columns² recently, reference was made to a combination of chloroquine and emetine in the treatment of hepatic amebiasis. This combination has proved eminently satisfactory, but a doubt has been raised by Chung Huel-Lan and Hou Tsung-Ch'ang,³ who reported in "Chemotherapy of Paragonimiasis" that during treatment of a patient for this disease with chloroquine, supplies ran out and the patient's condition retrogressed so much that simultaneous treatment with chloroquine base 250 milligrammes twice daily by mouth and emetine hydrochloride 30 milligrammes twice daily intramuscularly was started. After ten days, when a total of 600 milligrammes of emetine had been given, "the electrocardiogram showed T wave changes obviously due to the toxic effect of emetine or possibly emetine and chloroquine combined". After two more days, with the emetine total at 720 milligrammes, this drug was discontinued and chloroquine continued alone; twenty days later, after the heart had apparently recovered, the emetine was recommenced, but after eight days, when 400 milligrammes had been given, toxic effects recurred and the emetine was again discontinued. Chung and Hou seem to take a more serious view of this situation than is justifiable, for the safe possible maximum amount of emetine for a large adult is only some 780 milligrammes given over twelve days, with the patient absolutely at rest in bed; considerably smaller doses are usually recommended, of the order of 550 milligrammes given over twelve days. Obviously, the amount of emetine which had been given to this patient the first time was at about the level where myocardial intoxication could quite commonly be expected, chloroquine or no chloroquine; that it took only a further 480 milligrammes to cause trouble, after only three weeks of rest, is similarly well within the normal range of toxicity of emetine alone. It may be asked why Chung and Hou state, on the authority of this single case, that: "Our preliminary observations seem to indicate that chloroquine increases the toxicity of emetine when the two drugs are used at the same time. Before more is known it appears safer to use these drugs one after the other and not simultaneously, and even then the greatest caution must be exercised." While such a warning cannot be completely disregarded, it certainly seems that these authors have gone to the very extremity of caution in issuing it.

PLASTIC ORTHOPÆDIC APPLIANCES.

DIFFICULTIES of supply in Australia have so far prevented the introduction of polythene-polyurethane splinting. Even now these plastics may not be available, at short notice, in suitable forms, but there is every prospect that supplies from the United Kingdom will readily be forthcoming within the next few months. Polythene is one of the lightest plastics, and while not completely rigid, it retains its shape well; with strengthening strips it can be made strong enough for most splinting purposes. It is chemically inert and impervious to water and greases; it is completely translucent to X rays and to ultra-violet light; it can readily be moulded if heated to 120° C., and can be welded while at that temperature; and it can be

¹ J.A.M.A., February 19, 1955.

² M. J. AUSTRALIA, April 23, 1955.

³ Chinese M. J., November-December, 1954.

cut or drilled with ordinary tools. Polyurethane when foamed has a particularly fine texture, it shares the clinical inertness and other characteristics of polythene, it is soft and elastic and is an excellent insulator against heat; yet it retains its characteristics at higher temperatures than does polythene, though at 120° C. it will combine with, or rather adhere to, polythene. Foamed polyurethane is eminently satisfactory as a lining for plaster of Paris splints; a sheet one-eighth of an inch or more thick can be accurately moulded and cut to cover a limb, for instance, and plaster of Paris bandages can be applied directly over it, quite firmly—the polyurethane will compress easily to one-sixth of its original thickness. The plaster of Paris will penetrate the minute bubbles in the polyurethane sufficiently to form a unified cast which can easily be cut and reapplied. But splints, braces and supports of polythene lined with foamed polyurethane and moulded directly onto the patient by the techniques which have been described clearly by J. B. Brennan in "Moulding Polythene Plastic Splints Direct to Patient: A Safe and Practical Method"¹ and in "Plastic Appliances Moulded Direct to Patient"² appear to be so easy to make, and undeniably offer such prospects of lightness, durability, comfort and reasonable economy, that they are likely to come into extensive use, once supplies are assured, for many special and difficult cases.

A DENTAL HEALTH WEEK IN NEW SOUTH WALES.

A DENTAL HEALTH WEEK is to be sponsored by the New South Wales Branch of the Australian Dental Association from May 27, 1955. This is an event of which medical practitioners should be aware and in which they may try to interest their patients. The central attraction will be an exhibition which will be held in the basement of the Sydney Town Hall. The exhibition will consist of two main sections which may, to a certain extent, overlap. The main points of interest in what can be regarded as the purely scientific and professional section will be a series of displays explaining the causation of various dental disorders and emphasizing the means by which these disorders may be prevented. Great emphasis will be placed in this section upon correct and regular oral hygiene, the use of correct diet and the need for regular dental attention. The many facets of dental treatment will be shown in simple and straightforward displays. It is intended to construct a model waiting room and surgeries where the teeth of young children will be examined, and as an added attraction, the examination of the children's mouths will be televised during certain sessions. In addition to these displays, exhibits will be shown by the Institute of Dental Research, the Institute of Anatomy, Canberra, and the Commonwealth Bureau of Dental Standards. The Faculty of Dentistry within the University of Sydney, the United Dental Hospital of Sydney and the Royal Australian Army Dental Corps are cooperating in the general and individual displays. The United Dental Hospital of Sydney will make available from the staff of the Department of Preventive Dentistry at that institution a trained dietitian who will give advice on matters of diet. The principle of correct foods will be supported by displays arranged by such organizations as the Milk Board and the meat industry, which will form part of the commercial section of the exhibition.

The second, or commercial portion of the exhibition, will consist of displays by various commercial firms and organizations interested in dentistry or in the various principles of good dental health and good general health. Dental materials and equipment will be exhibited and the manufacture of certain of these materials will be explained. Exhibitions will also be made by toothbrush and dentifrice manufacturers as well as by a variety of other commercial bodies. Medical practitioners will be forwarding the aims of preventive medicine if they try to

interest their patients in this admirable undertaking; they will also be likely to learn something if they attend the exhibition themselves.

PARADOXICAL DIARRHOEA.

A VERY suitable term has been introduced by R. Wilson and C. H. Gundry¹ in an article entitled "Paradoxical Diarrhoea in Childhood" for a syndrome occurring mainly in children (but also in the aged), which is characterized by a moderate frequency of small watery bowel movements associated with impaction of a faecal mass in the rectum. The condition, variously known as "spurious diarrhoea", faecal impaction with overflow and faecal incontinence, is often regarded as and treated as simple diarrhoea, but it will usually be found that in this syndrome the desire for defecation is not heralded by the usual warning sensations, and that the faecal incontinence is involuntary and results in accidental soiling of the clothing. It arises in chronic constipation due to poor early training in habit formation or to interference with training, as in mentally deficient children, or to shortages of bulk and liquids in the diet, or to constant suppression of the defecation reflex because of pain from some lesion such as anal fissure, or because of expediency or as an expression of emotional upsets. Failure by the parents to recognize the existence of chronic constipation and to take the necessary action may then permit the aggravation of the impacted mass of faeces which is the real cause of the diarrhoea. The ultimate result may be the functional type of megacolon, not immediately distinguishable from neurogenic megacolon (Hirschsprung's disease) and involving a formidable differential diagnosis, including also fibrocystic disease, coeliac disease and spinal cord lesions. Wilson and Gundry emphasize the part played by emotional factors and by psychological conflicts between mother and child in initiating paradoxical diarrhoea. Time was, however, when every mother, no matter how vague about other things, could at least provide the doctor with prompt and accurate data concerning the state of her children's bowels, and when as a matter of course every family was lined up for the regular Saturday drench of senna tea, Epsom salts or liquorice powder—two features which did not noticeably give rise to psychological conflicts then and which are almost completely absent from present-day experience—and it might be asked whether there is any need to look further than parental ignorance or indifference for the basis of what is, after all, a purely automatic sequel to missed bowel motions.

AN HONOUR FOR SIR HENRY NEWLAND.

In the supplement to the *British Medical Journal* of April 23, 1955, there is an announcement which will be received with the greatest appreciation by medical practitioners throughout the Commonwealth of Australia. The Council of the Parent Body has decided that the Gold Medal of the Association shall be awarded to Sir Henry Simpson Newland who "combines high professional distinction with a long and very notable record of service to the Association and the medical profession". As we know, Sir Henry Newland has already received the Gold Medal of the British Medical Association in Australia. This is the first occasion on which the Gold Medal of the Parent Body will be presented to an Australian member of the Association. It is anticipated that Dr. A. Talbot Rogers, who will attend the Ninth Session of the Australasian Medical Congress (British Medical Association) at Sydney in August next, will make the presentation on behalf of the Parent Council, and that this ceremony will take place in the Great Hall of the University of Sydney immediately before the delivery of the Henry Simpson Newland Oration by Dr. Louis H. Bauer, of New York. The medical profession of Australia will unite in congratulating Sir Henry Newland on this distinguished award and in assuring him of the esteem and affection in which he is held throughout the Commonwealth.

¹ *Lancet*, November 6, 1954.

² *Ibidem*, April 23, 1955.

³ *Canad. M. A. J.*, March 1, 1955.

Abstracts from Medical Literature.

PATHOLOGY.

Thyroid Cancer.

L. W. SLOAN (*J. Clin. Endocrinol.*, November, 1954) states that from clinical and statistical studies of 282 cases of thyroid cancer and 513 cases of non-malignant nodular goitre and from other statistical studies of the incidence of simple nodular goitre, the following statements regarding the origin, characteristics and behaviour of thyroid cancer seem valid. Cancers are found most frequently in otherwise normal glands. Benign and malignant neoplasms exist in an unusually high incidence in the same gland concurrently, or at different times and at different sites. Cancer probably is cancer from the beginning and not a transformation. Simple nodular goitre rarely precedes cancer. Highly malignant histological types are seldom found before the age of thirty-nine years. Metastases, morbidity and mortality increase sharply after the age of thirty-nine years. The type and extent of treatment have far less influence on prognosis than age of the disease and age of the patient. Prognosis for cancer in the young is favourable, whatever the local findings. Prognosis for cancer with similar local findings later in life is unfavourable. Deaths occur in the young usually only after long duration of the disease. Deaths occur in the elderly often after long duration of the tumour, and usually relatively much sooner after diagnosis than in youth.

Renal Disease in Hyperparathyroidism.

A. D. MORGAN AND N. F. MACLAGAN (*Am. J. Path.*, November-December, 1954) describe three cases of hyperparathyroidism associated with renal fibrosis in adults. The criteria for distinguishing secondary hyperparathyroidism from primary hyperparathyroidism causing renal disease are examined in the light of the authors' experience and of published cases. The following conclusions are reached. The macroscopic and microscopic appearances of a primary parathyroid adenoma do not differ very sharply from some forms of secondary hyperplasia. Likewise the gross and microscopic findings in the kidneys do not differ greatly in the two diseases. Renal fibrosis in primary hyperparathyroidism is probably secondary to metastatic calcification. Renal fibrosis in secondary hyperparathyroidism generally is not due to glomerulonephritis. It is sometimes due to congenital causes, but the picture is confused by secondary calcinosis. Metastatic calcification is associated with a high calcium-phosphate product in the serum, but may also be influenced by disturbances of acid-base balance.

Structural Changes in Human Aortic Homografts.

M. E. DE BAKKE, O. CRECHOW, JUNIOR, D. A. COOLEY AND B. HALPERT (*Arch. Surg.*, October, 1954) made morphological

studies from one to three hundred and sixty days after transplantation on ten human aortic homografts. The results indicate that the human homograft loses much of its structural identity after transplantation and is in part replaced by fibrous connective tissue of the host. Minute hemorrhages occurring in the media from rupture of newly formed capillaries apparently provide the nutritional stimulus to the formation of new connective tissue. The elastic fibres of the media remain intact and support the graft during the period of connective tissue growth, reinforcing the graft from the outside. Satisfactory healing occurs at the anastomoses in the presence of extensive atherosclerotic changes in host vessels. No retrogressive changes, atherosclerotic or calcific, were noted in one graft three hundred and sixty days old.

Juvenile Melanoma.

R. C. HENDRIX (*Arch. Path.*, December, 1954) presents in detail a case of fatal malignant melanoblastoma in a two-year-old boy. The lesion in this case is compared with other melanomata of children which were either histologically benign or histologically malignant and clinically benign. The author states that a continuous series of increasing junctional activity can be demonstrated in the group as a whole. The neoplasm in the fatal case in the child was histologically similar to adult primary malignant melanoblastomata. In adult and pre-pubertal malignant melanoblastomata and in pre-pubertal melanomata with malignant appearance but benign course the junctional component is not in nests but is diffuse, replacing the lower levels of the epidermis over wide areas.

Wegener's Granulomatosis.

G. C. GODMAN AND J. CHURG (*Arch. Path.*, December, 1954) describe the pathology of seven cases of a syndrome (Wegener's granulomatosis) presenting severe destructive lesions of the respiratory tract, arteritis and nephritis, and tabulate the findings in 22 other reported cases. They state that this disease is characterized by aggressive necrotizing granulomata of the respiratory tract, generalized angitis, necrotizing glomerulitis and, frequently, disseminated granulomata. The anatomical findings are discussed, and those features of Wegener's granulomatosis differentiating it from similar and related disease patterns of necrotizing granulomatous processes, generalized arterides and mixed allergic angitis and granulomatosis are presented. Reasons are offered, based on pathological findings, for considering Wegener's granulomatosis a disease of hypersensitivity.

Sacro-Coccygeal Pilonidal Sinuses.

O. N. DAYAG (*Am. J. Path.*, November-December, 1954) states that study of a series of 463 cases of pilonidal sinus establishes the fact that, as compared with other surgical specimens, the incidence is roughly 1:500 in the material examined. The lesion is more common in males than in females and usually becomes apparent during the second or third decade. The frequency distribution as to age and sex shows that pilonidal sinuses tend to appear about five years

earlier in females than in males. The pathological picture is that of an acute or chronic inflammatory dermal sinus which contains dead hairs in about three-fourths of the cases. Hair follicles are never found in the walls of these sinuses. A review of the literature and correlation of the objective information with the various theories of pathogenesis have led to the rejection of the commonly accepted developmental or congenital theory in favour of the opinion that sacro-coccygeal pilonidal sinuses and abscesses are acquired. The recognition of similar pilonidal sinuses of the interdigital web as an occupational disease of barbers provides strong evidence for a similar mode of origin for the more common sacro-coccygeal lesions.

Myoepithelium in Gynecomastia.

P. N. KARNAUCHOW (*Am. J. Path.*, November-December, 1954) states that proliferation of myoepithelium plays an important part in the ductal hyperplasia of gynecomastia. Myoepithelial cells may proliferate either alone or together with the ordinary ductal epithelium to form benign intraductal papillomatous growths. Proliferating myoepithelial cells may also extend into periductal connective tissue, forming benign outgrowths still confined by the basement membrane. When regression with ductal atrophy occurs in gynecomastia, the myoepithelial cells persist after the ordinary epithelial cells have vanished and often remain as bizarre cell groupings embedded in dense fibrous tissue. None of these types of myoepithelial activity is likely to be confused with changes of a malignant neoplastic nature.

The Viral Range in Vitro of a Malignant Human Epithelial Cell.

W. F. SCHERER AND J. T. SYVERTON (*Am. J. Path.*, November-December, 1954) have found that cells from a stable strain of human epithelium (HeLa, Gey) kept under continuous cultivation *in vitro* since its derivation from an epidermoid carcinoma of the cervix in February, 1951, support multiplication of the viruses of herpes simplex, pseudorabies and vaccinia. Each virus causes destruction of the cells and produces either intranuclear inclusion bodies (herpes simplex and pseudorabies) or intracytoplasmic inclusion bodies (vaccinia). The destructive effects of herpes simplex or vaccinia virus are seen usually within one to two days after inoculation of virus, whereas for pseudorabies virus the cytological changes are commonly delayed for at least three to four days. Pseudorabies virus frequently causes discrete focal areas of cellular destruction; with herpes simplex or vaccinia virus, foci are seen only when a small viral inoculum has been employed.

MORPHOLOGY.

Regeneration of Pyramidal Axons Following Section.

J. W. LANCE (*Brain*, June, 1954) reports on attempts at regeneration, following trauma, of axons of the pyramidal tracts. Unilateral section of the pyramidal tract in the medulla was

performed in 12 adult cats, and the condition of the affected tract was examined electrophysiologically and histologically after survival periods of up to 170 days. Six cats were treated during this time with "Piromen" (Baxter Laboratories), a pyrogenic agent reported to inhibit glial tissue and thereby promote axonal regeneration in the central nervous system. No attempt at regeneration was observed in pyramidal axons. Complete degeneration occurred in almost all axons distal to the lesion, although a few axons remained in the caudal part of the pyramid. Axons on the central side of the lesion underwent a variable degree of retrograde atrophy. This degeneration was more marked in large axons, some small axons persisting to the edge of the scar for some months. Although the pyramidal tract gives off many collaterals in pons and medulla, this did not appear to be the only factor in maintaining persisting axons. It is postulated that the axon degenerates back to a node of Ranvier within some weeks of injury, and subsequently, after some months, back to the last collateral. The size and quality of the glial scar were not affected by the administration of "Piromen" during post-operative life. However, the glial barrier did not appear to be a factor in preventing the growth of axons.

Human Chorionic Villi.

J. D. BOYD AND A. F. W. HUGHES (*J. Anat.*, July, 1954) report new observations on the structure of human chorionic villi, made with the electron microscope at magnifications of up to 26,000 diameters. In areas on the surface of the villi possessing the so-called "brush border", the surface of the syncytiotrophoblast shows microvilli up to 3μ in height and terminating in small globular expansions. The authors give evidence that these structures are absorptive in function. The distribution of microvilli in limited areas, probably due to their cyclic formation and disappearance, makes it clear that the "brush border" of chorionic villi, although concerned in absorption, is a less elaborate and less permanent structure than that of intestinal and renal epithelium. This new development in microscopy has enabled the authors to obtain a clearer conception of the structural mechanism of a very interesting and vital structure.

Sex Determination of the Skeleton.

T. D. STEWART (*Am. J. Phys. Anthropol.*, September, 1954) discusses the reliability of sex determinations as made by measurements of the pelvis by certain authors, who claim that their method is more useful than the traditional one of depending on personal judgement, because it is explicit and can be improved to cover doubtful cases, and because a beginner can do as well as an expert, while the traditional method is not so capable of being taught. However, the author offers certain criticisms which, although they involve points that will undoubtedly be clarified in time, yet show that sexing by measurement is not something to be taught in "three easy lessons". He thinks that the method has promise, but states that until the method is perfected on known material it is a

mistake to suggest that it supplant traditional teaching and be applied rigidly to unknown material.

Cause of Lumbo-Sacral Fusion.

R. R. LANIER (*Am. J. Phys. Anthropol.*, September, 1954) comments on the conclusion of Thieme, based on statistics derived from measurements, that fusions of the lumbo-sacral articulation develop presumably during the post-natal life, in response to the stress of upright posture. The author shows that the evidence to date, from embryology, genetics, comparative anatomy, human anatomy and pathology, indicates that morphologically significant fusion of vertebrae at the lumbo-sacral level is a complex process related to other intersegmental variations in the spine, and that the process is genetically influenced and determined at an early embryonic stage.

Clastrum in Human Cerebrum.

A. S. L. RAE (*J. Comp. Neurol.*, February, 1954) gives an accurate account of the gross form and histological structure of the claustrum—the sheet of grey matter lying between the insular cortex and lenticular nucleus. The facts at present available suggest that the claustrum is no mere dependency or stratum of the insular cortex, and that it is connected to many regions of the brain. Its function, is unknown.

Cell Migrations in Central Nervous System.

W. HARKMARK (*J. Comp. Neurol.*, February, 1954) presents the results of morphological and experimental investigations which he carried out on a series of normal chick embryos at different stages of development from four-day embryos up to hatching. He studied the migrations of cells from the lateral region of the fourth ventricle (rhombic lip). He finds that there is an active migration of cells from the rhombic lip to the olive, pons, nucleus of the raphe and other nuclei in the grey matter in the *medulla oblongata*. The cell strands from the rhombic lip arise during a period of great mitotic activity in the neural epithelium, and the degree of differentiation of the cells increases with the distance from the rhombic lip. Experiments are described which have been carried out in order to obtain more definite information than that possible from normal preparations, to clarify cell origin and cell movements, and also to obtain more definite information about the distribution of the cells from the individual cell strands to the structures to which they contribute.

The Insertions of the Flexores Pollicis Longus et Digitorum Profundus.

J. L. WILKINSON (*J. Anat.*, January, 1953) reports topographic anatomy of the volar aspect of the digits of the hand that has passed unnoticed. Dissection of 100 fingers and 100 thumbs from adult human cadavers has revealed fundamental differences between the distal insertion of the *flexor pollicis longus* and *flexor digitorum profundus* tendons. These have been compared and correlated with relevant findings in 40 human little toes and a wide series of animal dissections.

The synovial flexor sheaths of 14 adult human fingers and thumbs have been injected, and 90 terminal phalanges have been examined.

NEUROLOGY AND PSYCHIATRY.

Epileptic Hemiparetics Before and After Hemispherectomy.

A. E. UECKER, L. A. FRENCH AND D. R. JOHNSON (*Arch. Neurol. & Psychiat.*, November, 1954) studied seven subjects of infantile hemiplegia with a battery of psychological tests before and after hemispherectomy. They state that hemispherectomy has proved to be a rather effective treatment for the convulsions and personality disorders that are often associated with infantile hemiplegia. However, improvement in intellectual functioning does not always occur. Improvement in mental functioning is probably dependent upon the integrity of the remaining hemisphere, which can hardly be assumed in cases of idiocy or imbecility. The authors suggest that further research by means of objective psychological testing will be necessary before hemispherectomy can be recommended as a means of improving the intellectual functioning of hemiplegics.

The Sense of Time.

F. S. DUBOIS (*Am. J. Psychiat.*, July, 1954) states that the invention of the time piece changed the general direction of human interest from heaven to the world, shifting the emphasis from eternity to the reality of the day. Quoting Gesell, he states that the eighteen-months-old child begins to grasp the meaning of "now". At two years of age he begins to understand the meaning of "soon" and "wait". At three years he begins to use the word "when" and "today". Shortly after this comes the word "tomorrow", and still later "yesterday". Subsequently children use concrete situations rather than abstract notions of time. At six years there is a new type of interest in the ages of young and old. At seven years he not only tells the time by the clock but is interested in time schedules. At ten years he is better orientated with respect to historical time and with local community time and cycles. The adult sense of time is not fully developed until the age of fourteen years. In the adult there is an apparent "inner clock" or "chemical clock" which regulates subjective time as distinct from outer time. As the individual grows and begins to face reality he associates time with authority, for example, to get up or to eat. This time may be equated with frustration of subjective urges. Even though the comfortably adjusted person views time objectively, his appreciation of duration is continuously changing—the happier the time, the faster it goes. It is well known that organic reactions can greatly disturb the time sense. Disturbance of time sense is also noted in depressed subjects, in schizophrenics and in the psychopath. These handicapped people all appear to be blocked from effective action. The disturbed sense of time may induce symptoms of these diseases.

Public Health.

HEALTH EDUCATION SEMINAR.

THE first Australian Seminar in Health Education, convened by the Commonwealth Government, was held at Canberra from January 11 to 21, 1955. The meeting was organized by the Commonwealth Department of Health, in conjunction with State health departments and the World Health Organization. The seminar was a residential one, all members except those living in Canberra being in residence at University House, Canberra. The main objective was an exchange of ideas and experiences of the members in health education. In preparation for the seminar, meetings had been held in all States of the Commonwealth during the latter part of 1954.

The classification of participants according to their training and experience was as follows: medical practitioners, 14; educationists, 7; nurses, 3; dentists, 1; physical educationists, 4; nutritionists, 2; sociologists, 2; health inspectors, 3; psychologists, 2; publicity officers, 4. A list of the participants is as follows: *Dr. Morven Brown, Director of the Department of Social Studies, University of Sydney; Dr. E. Clement, School Medical Officer, Australian Capital Territory; *Dr. F. W. Clements, Medical Officer in Charge, Social Pediatrics, Institute of Child Health, University of Sydney; Dr. J. J. Donnellan, Metropolitan Medical Officer of Health, Sydney, and Director, New South Wales Health Week Council; Associate Professor F. Dumas, Director of Physical Education, University of Melbourne; Dr. E. B. Durie, representing THE MEDICAL JOURNAL OF AUSTRALIA and the Royal North Shore Hospital of Sydney; Mr. M. P. Gerlach, Assistant Superintendent of Primary Schools, Department of Education, South Australia; *Miss M. Godfrey, Acting Principal, Women's College, University of Sydney; *Miss K. M. Gordon, Commonwealth National Fitness Officer, Commonwealth Department of Health, Canberra, A.C.T.; Mr. C. A. Gostellow, Secretary, Local Government Association, Western Australia; Mr. Robin Gray, Lecturer in Physical Education, Faculty of Education, University of Western Australia; Mr. R. E. Halliday, Superintendent of Youth Education, Education Department, Western Australia; Mr. H. Harris, Head of Department of Preventive Dentistry, United Dental Hospital, Sydney; Dr. G. S. Hayes, Medical Officer of Health, Department of Health, Brisbane; Mr. J. E. Holliday, Publicity Manager, Health Education Council, Queensland; Miss M. Holmes, Infant Welfare Sister, Maternal and Child Hygiene Branch, Department of Health, Victoria; Mr. D. W. Hood, Senior Education Officer, Commonwealth Office of Education, Sydney; Miss J. Howeler, Nutritionist, Department of Public Health, Tasmania; Dr. H. F. Hustler, Medical Officer, Department of Public Health, Adelaide; Dr. C. Jungfer, Medical Practitioner, representing South Australian Branch of the British Medical Association and the Adelaide University Student Health Service; *Mr. Lynford Keyes, Regional Adviser on Health Education of the Public, Western Pacific Region, World Health Organization; *Miss K. Kinane, Federal Youth Education Producer and Script Editor, Australian Broadcasting Commission; Mr. A. A. Krebs, Lecturer in Physical Education, Teachers' Training College, Queensland; Mr. H. D. Kruger, Health Inspector, Australian Capital Territory; Miss M. Lions, Senior Industrial Nurse, New South Wales Railways Department; Dr. Guy Lolson, Research Officer for Health, South Pacific Commission, New Caledonia; Miss M. McLachlan, Officer in Charge, Female Education Division, Department of Education, Port Moresby, New Guinea; *Mrs. W. M. J. McNamara, Convener of Parent Education Committee, New Education Fellowship, New South Wales Branch; Mr. J. D. Mabbett, Chief Inspector and Secretary, Brisbane City Council, Queensland; *Miss H. Martikainen, Chief, Health Education of the Public Section, World Health Organization, Geneva; Miss L. J. Martin, Senior Psychologist, Division of Mental Hygiene, Tasmania; Mr. R. E. Mathews, Public Relations Officer, Department of Public Health, Tasmania; Dr. E. S. A. Meyers, Director, School Medical Service, New South Wales Department of Health; *Mr. P. Pentony, Lecturer in Psychology, Canberra University College, Canberra, A.C.T.; Miss F. M. Peterson, Principal, Division of Nursing, Commonwealth Department of Health; Dr. J. J. Refshauge, Medical Officer in Charge, Infant and Maternal Welfare Department of Health, Port Moresby, New Guinea; Dr. David Roseby, Medical Practitioner representing the Preventive Medicine Section of the Victorian Branch of the British Medical Association; Mr. G. W. Slough, Publicity Officer, Department of Public Health, New South Wales;

Dr. M. P. Caaley Smith, Chief School Medical Officer, School Medical Services, South Australia; Dr. D. J. R. Snow, Medical Officer, Department of Health, Western Australia; Mr. David Swift, Public Relations Officer and Editor, Department of Health, Victoria; Dr. Derek Taylor, Medical Officer of Health, Palmerston North, New Zealand; *Mrs. A. G. Wheaton, Lecturer in Charge, Social Science Department, Adelaide University; Mr. A. G. White, Editor, "Family Health", New South Wales Health Week Council; Miss W. E. Wilson, Senior Nutritionist, Commonwealth Department of Health, Canberra, A.C.T.

The above list includes nine staff members responsible for the day-to-day organization of the work of the seminar, and for the editing and preparation of the official report. Only one of the nine staff members was a medical practitioner. The names of the staff members are marked with an asterisk.

Opening Session.

The seminar was formally opened by Dr. A. J. METCALFE, Director-General of Health, at a meeting held at the Institute of Anatomy, Canberra, on January 11. Dr. Metcalfe apologized for the absence of the Minister for Health, Sir Earle Page, whose other duties had not allowed him to come to Canberra. The Minister sent his greetings to the assembly with the earnest wish that the conference might be a success.

Dr. Metcalfe said that it was recognized by all that health education of the public had been an important part of the functions of health and education departments and local authorities in Australia for at least half a century. During the past fifty years there had been some very important trends in public health. At the beginning of the century the emphasis had been on what was now called environmental sanitation—the control of water supplies, food supplies, sewage and the like. These had been gradually controlled, although many major problems remained to be solved. However, they had become in the main the function of specialists—the engineer and the chemist had taken over the charge of water supplies and sewage.

Another trend was the change in the picture of infectious disease. With the control of water supplies and milk supplies, diseases such as typhoid fever and the dysenteries were no longer a problem in countries such as Australia, although Australians frequently had reason to wake up from their feelings of satisfaction when a break in their defences occurred. The discovery of the sulphonamides and of antibiotics had brought about extraordinary changes in certain diseases.

In spite of all these developments many problems remained to be solved. These were more or less of a personal nature, for example, the problems of psychiatry. Neuroses had become more and more an important part of our civilization. This might perhaps be the next phase to be attacked by public health people, but at the moment the stresses and strains of life were creating a huge burden of ill health.

Dr. Metcalfe thought it was now recognized that health education of the public was not the sole responsibility of the medical profession, but was shared by the members of many other professions. For that reason he was happy to welcome the educationists, the dentists, the nurses, the health inspectors, and the nutritionists among the delegates. In 1953 the Commonwealth Department of Health had been associated with the conduct of a seminar on mental health in childhood. He had been told that much of the success of that meeting had been due to the mingling of disciplines, as the members of each had been able to bring to the discussions the knowledge and observations peculiar to their own training and experience. These terms had provided the ingredients for a successful meeting.

The present seminar was really the culmination of a great deal of activity in various phases of health education in each of the States. Dr. Metcalfe believed that the quick visit to this country made by Mr. Keyes in July, 1954, had been of great value to the groups he met and that since then many delegates had been reading, thinking and discussing many of the questions on the agenda of the seminar. One could really say that the seminar had begun six months earlier.

The World Health Organization had made substantial contributions towards this meeting. Not only had Dr. Pang, the Regional Director, Western Pacific Region, arranged for Mr. Keyes to visit Australia in July, 1954, but the Director-General had now sent Miss Helen Martikainen, who was in charge of the Section of Health Education of the Public at the Headquarters of the World Health Organization; and Mr. Keyes was again visiting Australia. The expenses

incurred by the visit of these two people had been borne by the World Health Organization. This was Miss Martikainen's first visit to Australia, and the speaker wished to extend to her a special word of welcome. Miss Martikainen had joined the World Health Organization after a brilliant career and wide experience in health education in the United States of America. The presence of these two overseas visitors would be extremely stimulating to the discussions of the seminar.

Dr. Metcalfe then paid a tribute to the Master and Fellows of University House, Australian National University, who had graciously placed accommodation and many other facilities at the disposal of the Commonwealth Department of Health so as to enable the seminar to be residential. These arrangements should afford delegates plenty of opportunities for the informal exchange of ideas outside the programmed meetings. There was no doubt that informal discussions could be extremely important and valuable. Dr. Metcalfe also expressed his thanks to the Australian staff, who, although extremely busy people, had already given up a great deal of time in preparation for the meeting and who would spend the next ten days with the seminar without any material recompense.

World Developments in Health Education.

MISS A. HELEN MARTIKAINEN (Geneva) conveyed to the meeting most cordial greetings and good wishes from the Director-General of the World Health Organization. She proposed to deal with three principal topics: first, the interest of WHO in health education, next, the evolution of this interest with special reference to some recent international trends, and lastly, the importance of mixed "disciplines" in national and international meetings.

The interest of WHO in health education was essentially an expression of the collaboration of governments and people in member States. There was a growing recognition that the establishments and useful continuance of any health service depended on the people's understanding of its purposes, their acceptance of its values and their active support and participation. Health laws and regulations were useful, but experience was showing that the main reliance for disease prevention must be education, in order to enlist confidence and voluntary cooperation. The WHO Expert Committee on Health Education of the Public had stated that health education was concerned with the acquisition of knowledge and the development of feelings and behaviour in promoting those practices which were believed to bring about the best possible state of health and well-being. This concern with feelings and behaviour called for an understanding of the beliefs, habits, customs, and religious and cultural values of the people to be educated. The real essence of health education was working with people, to help them to achieve health by their own efforts. Health education meant a great deal more than "pushing pamphlets past passive people". Obviously it required a "personalized approach". Excellent examples of "personalized work" were provided by maternal and child health services; school health programmes; practical work in nutrition, sanitation and occupational work; home visiting by nurses; mothercraft classes; village and community projects and others. Miss Martikainen said that she looked forward to learning of this type of work in action in Australia. The extension of health education work in schools was of great interest in many countries at present. Another aspect of interest was the need for more coordinated planning and organization in health education activities. The evaluation of present methods and media was also of great interest at the present time.

Coming to the development of the health education programme of WHO, Miss Martikainen quoted two statements from the preamble to the constitution of that organization. The first was as follows: "That the extension to all peoples of the benefits of medical, psychological and related knowledge is essential to the fullest attainment of health"; the second: "That informed opinion and active cooperation on the part of the public are of the utmost importance in the improvement of the health of the people". WHO had commenced work in health education in 1949, when the first full-time technical officer in this subject had been appointed and a technical section established known as the "Health Education of the Public Section". This section was a part of the Division of Organization of Public Health Services. Some of its activities had been cooperation with member governments, sponsorship of seminars and conferences, fellowship programmes and training in health education, and the work of various expert committees. Since 1950 WHO had sponsored two regional meetings on health education—the first being the European conference held in the United Kingdom in April, 1953, and the second being a Latin-American seminar held in Mexico in September, 1953.

At both meetings the organizers had been fortunate in having a multi-disciplinary representation, the largest number of participants being medical officers of health holding positions of national, provincial or State, or local responsibility. Other professional groups represented had been private practitioners, dentists, nurses, health inspectors, health educationists, publicists, teachers, psychologists and anthropologists. Training curricula in principles and methods of health education were being organized at important institutes or schools of public health; for example, the All-India Institute for Hygiene and Public Health, the School of Public Health, Sao Paulo, Brazil, the Department of Social Medicine and Public Health, University of Malaya, the School of Public Health, Manila, and the School of Public Health, Ankara, Turkey. The first diploma course in health education in Europe had been started in 1954 in London. This course was being conducted under the joint auspices of the London School of Hygiene and Tropical Medicine, the University of London Institute of Education, the Institute of Child Health and the Central Council for Health Education. In the American region there were ten schools of public health where training in health education was provided for public health officers, nurses, environmental sanitation personnel, nutritionists, health educators and others.

With regard to current international developments, four broad trends were the use of Socratic methods as opposed to didactic ones, the use of visual media to suit local conditions, the training of health educationists, and the growing interest in health education on the part of voluntary organizations such as the League of Red Cross Societies. Recently an International Union for Health Education of the Public had been formed; this had been initiated at the first International Conference on Health Education of the Public held at Paris in May, 1951. A third International Conference on Health Education was to be convened by the Union in Rome in the spring of 1956.

Lastly, Miss Martikainen expressed particular satisfaction in noting that the present seminar represented several professional fields of interest, training and experience. She stressed the importance of teamwork, of the interdependence with other fields of research and experience and of the coordination of effort. Health education should use the principles and content of the biological and physical sciences, psychology, education, sociology and anthropology, mass communications, administration, economics and other things. It had to strive towards a partnership with the lay population in helping them to progress towards a standard of healthful living in which health was recognized as "a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity".

The Place of the Australian Health Education Seminar in Regional Activities.

MR. LYNFORD L. KEYES (Manila) conveyed to the meeting the sincere greetings of Dr. I. C. Fang, Director of the Western Pacific Region of WHO, and his best wishes for a successful seminar. Mr. Keyes believed that through members' own thinking out of their own problems and participation in planning for the seminar a high degree of cohesion had already been attained. Health education was developing in many different ways throughout the Western Pacific Region of WHO. No country, of course, was without health education, for wherever workers in the field of health, agriculture or social welfare were attempting with the help of voluntary agencies or even interested individuals to improve the health attitudes and habits of the people, there health education was already taking place. Some countries were naturally developing more rapidly than others. In some the stress seemed to be on the problem of providing a large number of professional educators; in others, he feared, attempts were being made to transfer programmes and procedures from the western countries without much change. Still other countries were emphasizing the informational or mass media approach to health education. It could hardly be said that any of these approaches were wrong, for in each country, he felt, health education was developing through self-determination. At some point in this seminar, it might be interesting to discuss some of the health education problems and activities of other countries. It was also hoped that the participants in the twenty-three-country Nutrition Education and Health Education Seminar which was to be sponsored jointly by the Food and Agricultural Organization and the World Health Organization in Manila in October, 1955, would be able to share in a first-hand exchange of ideas and experiences in health education. To him, one of the most constructive and creative trends which he had found in this region was taking place in Australia and was exemplified in the present seminar. He referred to the

interest and desire to take the long look at what was being done there in health education, to try to match needs and goals, and then to try to discover and apply the principles of modern health education. He had experienced this attitude throughout his visit to Australia in July, and to him this spirit of inquiry and appraisal was outstanding. He felt that this seminar with the planning which had preceded it, together with the consideration which had already been given to its aftermath, made it a truly notable contribution to health education in the Western Pacific Region of the World Health Organization.

Background and Preliminary Work.

In the introduction to the official report of the seminar, it was pointed out that health education of the public had always been recognized as one of the tools of public health practice. Only the methods changed, and the main objective of the seminar would be found in the realm of methods and techniques. Health education had been carried out for many years in varying degrees in Australia as part of the regular programmes of health and education departments and of various voluntary organizations. It was also recognized that wherever doctors, dentists, nurses, teachers, health inspectors and the like were at work a great deal of health education was going on. At the same time it seemed that a point had been reached where doubts were arising as to the effectiveness of existing methods of health education. The value of results gained from the expenditure of large amounts of money on such things as pamphlets, books and posters on health education had been sharply questioned. In schools, new educational methods were demanding a change in the approach required to satisfy the health and social needs of the child. An awareness of all this was the background for the preliminary discussions which had taken place when Mr. Lynford Keyes, Regional Adviser in Health Education for the Western Pacific Region of WHO, had visited Australia at the end of 1953. As a result of those talks it had been felt that before any further action could be taken a closer and if possible State by State examination of the problems should be made.

It had therefore been decided to invite the interest and cooperation of the States in a proposal to examine the situation at first hand. In this early approach to the States it had been indicated that WHO was willing to make available the advisory services of Mr. Keyes both for the preliminary discussions with the States and also for the proposed seminar. For various reasons the Commonwealth proposal to take part in this relatively new field of activity had had a mixed reception in the States, but, eventually, when the real nature of the offer was appreciated, State cooperation had been readily forthcoming. During July, 1954, Mr. Keyes had visited all States, accompanied by Miss K. Gordon, Commonwealth National Fitness Officer. In some States, Health Education Councils or groups already established had been the main point of contact. Elsewhere, States had been invited to bring representatives and interested groups together, and it had been hoped that those State groups would continue to function as pre-seminar discussion groups, examining the health education needs of their particular States and working out agenda items for the seminar in the light of those needs.

To assist these preliminary discussions an abridged copy of the Report of the Expert Committee on Health Education of WHO and other documents had been sent to interested persons and groups.

From the initial stages in the planning it had been felt that active State participation was vital and that the seminar's prime purpose was to meet the expressed needs of the States. For this reason no organized agenda had been drawn up beforehand. Instead the States had been invited to submit suggested topics for discussion. From these a composite list of subjects for discussion had been made. This list was brought to the first plenary session of the seminar and used as a basis for its work. Throughout the planning and into the seminar itself, it was continuously emphasized that the purpose of the discussions was to provide an opportunity for the free exchange of ideas and experiences and for the discussion of technical problems confronting those working in the field. It was also stressed that it had never been intended that formal resolutions should come from the discussions, but that those attending the seminar should return to their States stimulated and reinforced to carry the work of health education forward in whatever field was their concern.

Health Education in the States of the Commonwealth.

A brief summary of activities concerned with health education in each State was prepared and supplied to each member of the seminar.

Organization and Working of the Seminar.

The work of the seminar was conducted in both plenary and group meetings. Four discussion groups were formed from the forty-five members, each group including people of a variety of professions and from various States of the Commonwealth and elsewhere. These groups formed the forums for most of the discussions. Brief reports of group proceedings were relayed at intervals to plenary sessions and informal addresses delivered at plenary sessions were in turn discussed by the groups. The general trend of the seminar was guided by a "steering committee" which included the staff members, listed above, and two representatives from each of the four discussion groups. A visual aids committee, a publicity committee and a library committee were formed, and at the end of the seminar members of each profession present met as professional groups to record their appraisal of the work done. Group discussion reports were edited by the staff at the end of the seminar; these summaries have been used in the group discussion reports given below.

The Social Basis of Learning.

DR. S. MORVEN BROWN (Sydney) said that the task of health education was to promote a concern in each individual for physical and mental hygiene, to encourage the growth of healthy habits and attitudes and to foster a sense of community responsibility for the creation and maintenance of a healthy social and material environment. Although its main formal agencies were schools and health authorities, much health education was given incidentally by such professional people as doctors, nurses and nutritionists in the course of their regular work.

Schools taught health by bringing out its meaning and importance in the course of subjects like science, social studies and physical education. Opportunities to teach health principles occurred incidentally in the course of dealing with school accidents, safety campaigns and even the care of school pets. In some school systems, for example, in the primary schools of New South Wales, graded courses in health education had been introduced into the general curriculum. School medical services also played a part, not only in the promotion of health services, but also in the promotion of health campaigns in schools, and in influencing teachers to show a concern for good health. Altogether schools were expected to take a considerable interest in their pupils' health and to promote healthy habits as they affected food and eating, elimination, exercise and play, sleep and rest, care of the eyes, ears and teeth, posture, illness and disease, accidents and injuries, and emotional adjustments and sex adjustments.

Health education authorities, which might include health departments or health education councils, carried on continuing programmes along various lines, or else directed campaigns to cope with particular problems or emergency situations. A good example of a continuing programme was that provided by the Queensland Health Education Council, which since 1945 had been spreading health knowledge through various media, including newspapers, radio, motion pictures, lectures and so on. In addition it had provided text-books and a syllabus for schools, and had encouraged health education among local government authorities. One of the most striking examples of a campaign was that launched in Western Australia at the time of the recent Royal visit to cope with an epidemic of poliomyelitis.

In considering this great diversity of approaches and agencies involved in health education, the question might be asked: What if anything did they all have in common? Were there any basic principles of learning that were relevant to the problem of health education in general? Dr. Brown suggested that certain common aspects were *prima facie* apparent. First the health educator was essentially concerned with getting the voluntary cooperation of his public. Unless people freely elected to cooperate with him, he could rarely be confident of success. Even children, though they might be compelled to learn things, could not be made to put them into practice until they became willing and interested to do so. And as for adults, even the most totalitarian type of government could enforce hand-washing, for instance, only if there was a general disposition to cooperate. Secondly, the health educator was mainly concerned with changes in attitude and interest rather than with disseminating difficult information. Of course, it was true that reasons for good health behaviour might be scientifically complex. It was also true that people would respond most effectively if their understanding as well as their goodwill was enlisted. But the fact remained that the heart of the difficulty was not so much the dissemination of facts as the changing of behaviour. The third characteristic

of the health educator's task—at least in communities like our own—was that he was usually and mainly involved in a struggle against apathy and indifference rather than with ignorance, open hostility or resistance. Finally, the health educator was often attempting to do things whose effects could only with difficulty be evaluated. It was possible to count the number of people who responded to appeals to give blood to the Red Cross Transfusion Service, but impossible to be sure whether people were really influenced to feel the value of exercise, or to eat according to the principles of good nutrition.

In regard to the second question posed, namely, what principles of learning were relevant to the problem of health education in general, it appeared that psychology had been slow to concern itself with the kinds of educational task that the health education worker had to handle. Only slowly had adequate social emphasis been incorporated in psychological theory, and only gradually had even educational psychologists become interested in the process of changing basic attitudes and interests. However, the problems of social learning were now being tackled, and especially valuable findings were being accumulated by those social psychologists who, following the lead of the late Kurt Lewin, had been studying the behaviour of individuals interacting as members of small groups.

In any piece of effective learning there could be distinguished certain common features. The learner had a strong motive to drive him on to action; he met certain difficulties or barriers, physical or intellectual or social; he perceived various possibilities of relevant action; and after selecting the one that brought him to his goal, he experienced a rewarding feeling of satisfaction at achieving what he wanted to achieve. All learning came from personal effort, effort so intense as to amount to struggle. It was a dynamic outgoing activity undertaken by a person with a strong motive. In short, people were most likely to learn when they wanted to achieve some goal that seemed personally important to them. The factors, drive, barriers and reward, had for all human beings an essentially social character, for they were affected by the whole process of acculturation that each individual experienced as he grew from birth to maturity. The things any individual most wanted to do, the kinds of prohibitions and controls that regulated him, the kinds of satisfaction he would find particularly rewarding—all these patternings of his behaviour were imprinted on his personality through a long succession of learnings within the culture that had nurtured him.

Learning, in its most enduring form, arose from activity, from the compulsion of motives that created a wish to learn. To arouse motives it was necessary to tap basic human needs and relate an educational approach to their fulfilment. Those needs might be mainly innate potentialities for action, such as hunger, thirst or capacity for fear or anxiety. But over and above such primary drives there were the multitudinous secondary or acquired drives—drives arising from needs for security, for an adequate feeling of group belonging, for status within groups felt to be attractive, and for conformity to various group codes and standards.

If health education was to be successful, if people were to be led to accept new modes of health conduct, the approach had to be related to the life goals and interests of the group aimed at. Two immediate implications might be noted. One was that in our society the primary motives were not likely to yield good results if they were played on too crudely or simply. Thus, although fear and anxiety might have to be whipped up in the case of an emergency like an epidemic, they were not likely to yield good results if they were induced too obviously in less critical campaigns. The reason was that the more terrifying and widespread health dangers did not now occur very often in modern advanced societies, so that to invoke fear symbolically through advertisements without real cause was to incur the penalties attaching to those who cried "Wolf". Secondly, it was wrong to assume the existence of any general drive towards health or healthy living. Certainly good health aided people to do and to achieve the various things that seemed important to them. But the connexion was too general to stimulate any strong desire for health or healthy living as ends in themselves. Indeed it might well be quite undesirable to promote any sort of preoccupation with matters of health and disease, as the anxieties so induced might lead to emotional ill health.

A misplaced approach through anxiety was frequently to be seen in propaganda about venereal diseases. An interesting example of such a method had been cited by Goldston in the form of a booklet addressed to American high school students. The booklet contained "standard facts" illustrated by grim and frightening pictures together with warnings

that kissing and "petting" might lead to infection. Goldston criticized the booklet, contending that a more suitable approach would first and foremost bring affirmation and assurance. "Affirmation that the stirrings of youth, in spite of concomitant embarrassments, confusions and troubles, were but precursors of the opportunities, achievements and satisfactions of adult life, and assurance that many of the fears, superstitions and misconceptions were indeed such. It would name them by name to discredit them. It would offer sound advice on how the youngsters might meet and deal with their common problems, in being and in behaviour, and how they might advance and prepare themselves for the great adventure of adulthood. Somewhere in the text there would be mention of the venereal diseases, but only as conditions which impeded progression towards youth's goals. Youth was not normally interested in the venereal diseases."

A recognition of the social basis of learning could have three further corollaries for health education workers. The first was the importance of cultural patterns. No educational approach was likely to get very far unless it was brought into living relationship with the cultural patterns of the particular groups to be reached. The resistances to change that existed in primitive cultures were reasonably well understood—at least in principle—because there were plenty of examples in such societies of the way magical and superstitious beliefs and attitudes might surround and support unhealthy and unhygienic practices. What was often insufficiently realized was that civilized societies might also have their own subtle forms of folk resistance, and that further, any society always comprised subgroups having their own distinctive cultural characteristics and resistances. An example was the changing styles of life followed by one such subgroup, the female sex subgroup. Undoubtedly these changing social habits were affecting the extent to which women were now prepared to breast-feed their babies. Latest figures in England showed that only 53% of babies were breast-fed at the end of the second month, and 28% at the end of the seventh month. The explanation of this state of affairs was to be found only through intimate understanding of the changing patterns of motivation that were affecting modern women. That many of the reasons given—both by women and by doctors—were superficial and wrong in fact was revealed by an interesting analysis by three British health education workers who compared a number of these reasons with the evidence presented in the 1948 survey, "Maternity in Great Britain". For example, one common reason given was that mothers were overworked and did not have enough milk. As against this the survey showed that of mothers who had domestic help during pregnancy and the puerperium, 42% were bottle feeding at three months as compared with 41% of those who had no help.

Similarly the attitudes and prejudices towards health existing in the minds of any given social status group must be sympathetically studied and understood before an effective approach could be made. An unskilled worker, for example, might be unwise to spend money on bets and beer that he should be spending on visits to the dentist. But it would be equally unwise to imagine that there was much chance of arguing him out of such behaviour by purely rational appeals or by generalized propaganda. The approach to such a man would have to be highly specific, nicely adjusted to an awareness of why and how such conduct was supported by the motives that underlay the rest of the worker's life design.

Sometimes, too, health education might fail because of a sheer miscalculation of the level of understanding of some particular group. The language might be unusual or difficult, or the ideas themselves strange and unreasonable to some of the groups they reached. In many circles the barriers to understanding far transcended limitations of language or intellect. Old wives' tales about the need for tonics to purify the blood, or about pregnancy and childbirth, or about the ability of quacks to cure certain dangerous diseases—all such notions might seem eminently reasonable to those who accepted and circulated them. Through sensitive awareness of the dimensions of human error and misunderstanding, in their variety of forms, one might gain a more favourable vantage point from which to communicate new ideas and habits.

The second corollary that followed from a recognition of the social basis of learning was that the health workers must become aware of the social structures of the groups they hoped to change. In addition to its own unique way of life, each community or group had its own quite distinctive systems of power and prestige. Each had to be appreciated in terms of its "key" people—people having special power and influence—and not simply as an unorganized aggregate of equal human units. Key people

included not only the official leaders, but also the unofficial informal leaders. By getting their cooperation a bandwagon effect could be achieved, of the type seen in the ordinary spread of new fashions. It should be remembered, too, that many of the health superstitions referred to were in fact most deeply entrenched in the minds of the leaders. To ridicule such notions thoughtlessly was often to arouse opposition of a peculiarly destructive and influential kind.

The third corollary was that health education workers should direct a large part of their effort to small groups having strategical importance in particular communities. This meant enlisting the aid of powerful group forces which could assist the process of individual decision and commitment. Through group discussion people could be raised out of their "quasi-private psychologically isolated situation" (as Lewin called it) and led to a wholehearted acceptance of ideas and attitudes that they had joined with other groups in formulating.

Much recent research and practical experience had combined to promote confidence in the efficacy of working with small groups. It was becoming clear that such groups exerted powerful and intimate forces of control over individual conduct. Of course any such approach by groups must be most carefully planned and carried out. Methods of "democratic" participation in group decision-making yielded the best results. People who were just talked at, or flooded with information, would often remain indifferent or unconvinced. But if they were given a chance to talk a new idea over and to come to their own conclusions about it, they were much more likely to feel committed to any new behaviour that acceptance involved.

The encouragement of community participation in particular campaigns could go far beyond the use of small neighbourhood groups, and in the future ingenuity would reveal ways in which even mass educational efforts could be tied in with some attempt at community participation. To advocate more effort to secure more community participation was not by any means to say that mass advertising and communication had no place in health education. Such a notion would be entirely wrong. But there was good reason to believe that much mass dissemination of information achieved no practical result whatever. It was true, of course, that large-scale commercial advertising appeared to have striking success. But so often the commercial advertiser was not really trying to produce genuine changes of attitude. Rather he was bending all his efforts to gauge the mass demand with a view to satisfying it.

The need in health education was for methods that made possible the participation of the public in a group discussion involving them in decisions to apply the conclusion they reached. This approach was not only democratic; it had the great merit of sincerity, of trusting the facts to speak for themselves. And it happened to be the one that could really produce changes in behaviour and outlook.

Discussion.

In the discussion on Dr. Brown's contribution it was agreed that learning went on in social settings which needed to be understood by the health educator, and that very little real change in people's thinking and behaviour would take place if health education was simply disseminated without proper regard to the needs of the groups to be reached. There was also agreement that appeals to a vague desire for health or an interest in healthy living were not well-founded; that somehow those desires and interests had to be linked with the purposes and goals that really motivated particular groups of people. Two of the four discussion groups emphasized the idea that an exaggerated interest in health was in fact an unhealthy attitude to implant. One group raised the question whether the very progress of public health and the steady conquest of disease had not increased the problems of securing public interest in health matters. Communities which felt secure from the more obvious threats to health tended to become indifferent to health propaganda or even bored with it.

There was no dissent from the idea that some of the most powerful human motives were socially moulded and expressed. The desire for approval, the need for security and conformity were important. One group, however, would not agree that the appeal to fear was unwise, pointing out that the very success of the campaign against the spread of poliomyelitis in Western Australia at the time of the Royal visit was based largely on the deliberate stimulation of public anxiety. However, while it was felt that fear could be important in special emergency campaigns, it was agreed that indiscriminate appeals to fear weakened their effectiveness in times of genuine crisis. It was also contended that too much fear might provoke anxiety dangers

of its own. It was submitted by another group that such primary needs as sex and hunger must still be regarded as powerful motives, and that the fact that varying expression of these desires at different times and in different races had to be studied, did not reduce their importance or the account the health educator must take of them.

All groups agreed that educators should keep in the most sensitive touch with the needs and the way of life of the communities they wished to influence. The goals and needs of, for example, working mothers, adolescents, or factory workers had to be understood sympathetically if their behaviour was to be influenced. Much interest was shown in the value of professional people concerned with health education becoming part of the community they wished to reach. Two delegates gave instances of this. One, a nutritionist, showed how a campaign advocating rose hip syrup as a source of vitamin C had been based on personal discussions with groups of mothers; the other, a psychologist, described how parents of subnormal children had been stirred to organize a scheme of education by various forms of unobtrusive suggestion in schools, clinics and local committees. The role of the family doctor in acquiring an intimate knowledge of the values and prejudices of his community was raised, and one group found this a good reason for urging the inclusion of general practitioners on any council concerned with health education.

It was agreed that often the most effective community influence was exerted through an awareness of the people or groups possessing power or prestige. In one group a health inspector analysed the different interests to be taken into account in the promotion of clean food handling. First came the large industrialists, with all necessary knowledge and equipment; then came an intermediate group with reasonable standards but certain deficiencies, and then a large group of casual workers, of low educational standard, careless, often dirty and representing a "health inspector's headache".

Although a number of delegates objected to any suggestion that there was anything new about the idea of appealing directly to small groups of people, there was no dissent from the view that such techniques should be used more extensively. But the small group method should not be stressed unduly; there was a continuing need for a variety of methods of approach in health education.

It was generally felt that the influencing of behaviour, whether of individuals or groups, really did involve the cultivation of skills in human relationships. This point was stressed particularly by one group, which felt that good human relationships were not only a point of effective health education, but were also linked with the whole question of mental health and mental hygiene. It was at the instigation of this group that a special panel discussion, in the form of a sociodrama, was arranged on the final evening of the seminar to discuss the general significance of human relations between people of varying role and status in the community.

The Extent and Nature of Health Education Needs in Australia.

Dr. D. J. R. SNOW (Perth) said that he believed that most of those present, if not all, had come to the seminar to learn how to make use of health education in order to postpone death, prevent disease and disability, and promote health. In his own work, which was related mainly to the prevention of communicable disease and the control of epidemics, he had been very much impressed by the power of health education in special circumstances and was eager to learn how this valuable shield against ill health could be developed. However, it was difficult to get the most out of a seminar such as the present without some preliminary examination of the main problems with which they were confronted in the field of health.

It was, of course, impossible in a brief address to present a full and balanced picture of the extent and nature of health education needs in Australia. All he proposed to do was to describe an unusual concept for measuring the relative importance of various causes of death, to comment briefly on the major causes, and to enumerate a few of the categories of morbidity which seemed to offer useful subject matter for discussion. The essential purpose was to focus attention on certain practical and specific topics, and to provoke thought and discussion as to how health education could contribute towards the solution of the problems involved.

About three years previously he had examined the mortality statistics in Western Australia with the object of trying to find out what were the most important causes of

death from the point of view of useful years of life lost rather than from the conventional viewpoint of numbers of deaths. This study had been published in the "Annual Report of the Commissioner for Public Health" for Western Australia for 1951. The results were startling and might be of assistance in adjusting perspectives while they were considering the subject of health education. For over a century the main yardstick for the measurement of public health had been mortality. At first the number of deaths in a year had been used as a guide; later, mortality was expressed as a rate per given number of the population. Next the influence of the varying age structure of a population had been recognized and the concept of a standardized death rate introduced. Dr. Snow showed a chart showing that when the actual numbers of deaths in Western Australia were examined, heart disease and cancer occupied the most prominent positions. But if the age at death was taken into account so that the loss could be measured in terms of "years of useful life lost" and, in effect, of productive man-hours wasted, a striking change took place. The lead was assumed by accidents, especially automobile accidents; and cancer and heart disease were relegated to third and fifth places respectively. The importance of tuberculosis was enhanced by being moved up from seventh to fourth place, while suicide was transferred from thirteenth to seventh position. In compiling these figures, males only had been considered, as, in the main, they were the wage-earners; and the upper limit of sixty-five years had been chosen as this was the usual age of retirement. The mean of decennial age groups had been used for convenience in computation and to assemble figures large enough for analysis. The age group from birth to ten years had been omitted from the preliminary study because the effect of neonatal and infant deaths would obscure the general pattern. They constituted a special problem. Dr. Snow said that he had examined briefly comparable figures for the whole of Australia and saw little reason to doubt that the overall picture would be like that of Western Australia.

Accidents, when viewed in that light, assumed overwhelming importance as a cause of premature death, and acquired an importance which was even greater than was already realized. Automobile accidents were responsible for the greatest loss of life; and home and industrial accidents came next as destroyers of the useful years of life.

Cancer was still largely an incurable disease, but a proportion of cancers in certain parts of the body were curable if detected early. This applied particularly to cancers of the breast and of the uterus. Health educators could do a valuable service in encouraging women to seek prompt medical advice when they noticed a "lump in the breast", a vaginal discharge or unusual bleeding. Better still, women over forty might be encouraged to seek regular gynaecological examination. So far as men were concerned, a most alarming feature was the swift increase in lung cancer over the past fifteen or twenty years, and its impressive association with excessive smoking. Health education had obvious scope in this field, and discussion on this topic could involve almost every interest represented at the seminar.

Coronary disease, the most common cause of sudden death, was killing off many of the ablest Australians in their forties and fifties. It was convincingly related to tension. The high pressure executive, rushing from one committee to another, answering innumerable telephone calls, going without meals, smoking dozens of cigarettes and working on Saturdays, was the most likely victim of this condition. The reduction of emotional tension would be a profitable topic for discussion because tension was associated with other things beside coronary disease and high blood pressure. It was connected with duodenal ulcers, persistent indigestion, psychoneurotic breakdowns and a variety of ill-defined conditions.

With regard to tuberculosis, the main principle was detection and treatment of the infectious patient at the earliest possible stage. A first-class organization already existed in Australia for the control of that disease, but despite compulsory legislation in various States, the campaign could not succeed unless maximum public cooperation was secured. The guarding of coughs and sneezes, regular X-ray examinations of the chest and prompt medical attention in the event of untoward chest symptoms were a few of the principles which health educators could use in that field.

Dr. Snow said that in his own discussion group and elsewhere much concern had been expressed about ways of promoting mental health. It was reasonable to hope that health education could do much to minimize self-destruction. Apart from the five main causes of early death, there were a number of diseases which could be combated by educative

measures. The first category of those might be called diseases due to hand contamination. Typhoid fever, the dysenteries, infantile diarrhoea, so-called "food poisoning" and even poliomyelitis could be ascribed in the long run to a defect of personal hygiene on the part of someone or another. Dr. Morven Brown had commented on the Perth epidemic of poliomyelitis and the apparent success of control measures. During those very worrying weeks one thought had been uppermost in the minds of doctors in charge of control measures. This had been the amazing degree of public cooperation which had been secured and the astonishing results of health education. There was little doubt that if one took the public into one's confidence during a health emergency and if they were frightened, there would not be the slightest difficulty in putting health education measures across. In between emergencies the task could be extremely difficult. The theme of hand-cleanliness was one which in his opinion could not be over-emphasized in any programme of health education.

Dr. Snow next discussed diseases against which immunization procedures were available. The most important of those at the moment were diphtheria, tetanus and whooping-cough. Fortunately triple prophylactics were now available and the task had become simpler, but the obligations of health educators in that connexion would not be discharged until the demand for "triple immunization" equalled the birth rate.

Coming to insect-borne diseases, Dr. Snow said that the hazards of flies, fleas and mosquitoes were well known, but the first two at any rate continued to account for a certain number of cases of intestinal disease and typhus fever respectively, while mosquitoes constituted a constant potential danger. Control was far from complete and it was certain that health education could make a further useful contribution.

Mental health constituted an urgent problem; the amount of mental disorder in all States of the Commonwealth should be a matter of grave concern to all. Although mental disorder was a field for highly trained specialists, members of the seminar might consider it with profit and see what could be done to reduce the factors precipitating tragic breakdowns.

In Western Australia the health of aborigines presented some problems; the principal diseases to be combated were leprosy, trachoma and venereal disease. The prevention of these came within the scope of health education. Improved living conditions, better sanitation and personal hygiene, and changed attitudes of mind would do much to reduce such problems which at the moment offered fruitful fields for the health crusader.

In concluding, Dr. Snow pointed out that there were many other problems which he had deliberately omitted in the interests of brevity or because he did not feel competent to comment on them; but if his address helped to provide a few clear-cut topics for discussion, his object would have been achieved.

Definition and Aims of Health Education.

MISS A. HELEN MARTIKAINEN (Geneva) quoted two sentences from the Report of the First Session on Health Education of WHO. The first was: "Health education, like general education, is concerned with change in the knowledge, feelings and behaviour of people. In its most usual form it concentrates on developing such health practices as are believed to bring about the best possible state of well-being." For the most effective results, the methods and procedure of health education had to take into account the following: the goals, interests and needs of the people; their present level of knowledge, and their beliefs, attitudes, feelings, religions and cultural values; the resources and services available; the powerful influence of family or group standards and sanctions; and the fact that learning was an active process, a fact which meant that as long as a person remained passive towards a problem or condition no change for the better could take place. Any change and improvement in the knowledge, attitudes, beliefs and practices of people would come about primarily through the personal efforts of the individual, family and group concerned. The main deficiency of didactic methods and procedures in health education was that the person or group receiving it was a passive recipient rather than an active one. The health educator should not assume that people learnt merely because he disseminated information. People were more interested in achieving what they wanted or coping with their own practical problems than in health as such.

The primary purposes of health education were stated by the first session of the Expert Committee on Health Educa-

tion of WHO to include the following: First purpose: "To help individuals to become competent in and to carry on those activities they must undertake for themselves, as individuals or in small groups, in order to realize fully the state of health as defined in the Constitution of the World Health Organization".

The solution of most of the health problems cited by Dr. Snow depended largely on the responsibility and action taken by individuals, family groups and community groups. If it was possible to translate the mortality statistics cited by Dr. Snow into saving of human lives merely by "selling the facts to the people" the total task in health education would be a relatively easy one. However, it was becoming increasingly clear that many health problems could not be solved unless the people concerned were interested and willing to assume responsibility and to work together with health education workers in doing something about them. Such problems were: the prevention of accidents; child care; prevention and control of tuberculosis; improvement in interpersonal relationships and related mental health problems; reduction of the stresses and strains which led to cardiac affections and emotional problems; personal, family and community sanitation; and improvement of individual and family dietary practices.

The second purpose of health education as stated by the first session of the Expert Committee on Health Education of WHO was: "To make health a valued community asset." There were a number of factors which influenced the value any given social group or community placed on health; for example, the level of general education, the availability and quality of the curative and preventive health services, the degree of individual and community concern for the welfare of its members, and the economic resources available to the people. The need for individual family and community education in health was very often tied up with social, economic and educational problems. Hence the problems of first priority to any given population group might not be health as such, but might be the concern and need to improve housing, to build roads, to extend irrigation, to improve agricultural practices, to establish schools or to earn a livelihood. Therefore public cooperation for health improvement might start with other problems of immediate interest and concern to the people and then progress to health problems as the people became more aware of them and were interested to do something about them on a well-informed basis.

The third purpose of health education as stated by the Expert Committee of WHO was: "To promote the development and proper use of health services." The real effectiveness and success of any health service depended on the people's understanding of its aims and scope, the confidence which they had in the health worker and in the services provided to allow them to take an active part in the health programme. Good human relations had a most important bearing on public interest in the support of various health programmes. This included acceptance of people as they were, respect for the sanctity of the individual personality, and an understanding approach based on an innate liking for people. The working atmosphere of any given health service had an influence on the public attitude to health personnel and on their confidence in the services being provided.

Discussions on Papers by Dr. Snow and Miss Martikainen.

It was agreed that Dr. Snow, by his statistical treatment of mortality figures, had presented an interesting angle on the effect of certain diseases and conditions on human economy. The most effective way to present this information to the people to arouse their interest was discussed on a number of occasions during the seminar. Some groups were concerned, however, with the suggestion that the main emphasis in health education should be directed towards a reduction of death rates. While agreeing that this was an important task, which should not be neglected, they drew attention to an aspect of health education which had been discussed by Miss Martikainen. In its usual and most effective form health education was concerned in developing those health practices which would help people to live happier and healthier lives. This was achieved in many ways; for example, by using all the services available, so that mothers could help children to grow and develop to their full potential; by learning to recognize disease and disability in its earliest form and to seek prompt and adequate medical care so that much ill health and unhappiness could be prevented; by endeavouring to change an unfavourable environment where possible, and where this could not be done by learning to effect an adjustment to environment in the interest of good mental health.

Ways to reduce the toll of accidents were discussed. It was agreed that, besides the traditional methods (for example, posters, pamphlets, films, Press articles and radio talks) which had their place in any educational programme, an entirely new approach should be devised which would take the programme into the home. It was pointed out that parents and citizens' associations, mothers' clubs and youth clubs were groups normally interested in this problem, through whom health workers could reach individuals. However, it was not enough to send pamphlets and other material to these groups. A personal visit by a health worker was essential; the groups should be encouraged to discuss the problem, and if they could participate in a small survey or other piece of activity so much the better.

Attention was drawn to the significant fall in the death rate from traffic accidents in the ten to fourteen years age group during the last ten years and the lesser fall in the fifteen to nineteen years age group in the last few years, whereas the rates for all other groups had continued to rise. There was every reason to believe that these falls in death rates were primarily due to the teaching in schools and other places by the Police Road Safety Instructional Units. It was agreed that the work of these should be intensified and extended. Ways and means had to be found to help the mothers of pre-school children to impart to their children an awareness of accident hazards and a healthy attitude towards accident prevention. Mothers' clubs were a ready-made group in this age range; they had the interest, and with a little guidance would respond.

Stress in modern life and its relationship to heart disease were discussed, including ways of interesting potential victims of this disease in preventive health measures. Although this was essentially a personal problem for individuals, their interest might be aroused in the subject if groups of men and women in the middle span of life could be stimulated to discuss the problem. In this connexion it was pointed out that in many fields of health education immediate results could not be expected; it took a long time for health measures to become effective and this would be particularly true of heart disease. Again, personal contact by a health worker and active participation by the group were essential.

During this discussion, Dr. C. Jungfer (Adelaide) gave an account of the Adelaide Hills Children's Health Scheme, a piece of work which had been initiated and carried out by a group of general practitioners during the past ten years. Later Dr. Jungfer showed a film illustrating conditions in the Hills district.

Groups to be Reached by Health Education.

The subject of the groups to be reached by health education was not discussed at a plenary session, but was initiated in group discussions. The reports were presented at a plenary session. The following statement has been prepared from these reports and from the subsequent discussion at the plenary session.

It was pointed out that health education was concerned with people, both as individuals and as members of groups; much time and effort could be saved if workers in the field of health education would work with groups. The needs of these groups, the ways in which the needs of some groups had been met by existing programmes, and the techniques which might be used to meet the needs of other groups were dealt with.

It was stated that the family was the basic unit of society, and that special emphasis should be placed on its needs. The family as a whole often required guidance to help it to solve all manner of problems, including domestic, financial, emotional and social problems. The services available were limited. More important, however, was the fact that family members were frequently loath to talk over their problems with outsiders. Parents often needed guidance in the care and management of their children. The requirements for good physical health and optimal growth were well understood by many parents and in most parts of the country the services providing this type of advice were adequate. Sound emotional adjustment was important for good mental health, but this was less well understood by many parents and the facilities for giving advice and guidance to parents in this field were fewer. Similarly the services available for the physical care of the pregnant woman were adequate in most parts of the country, but the emotional problems were less well understood and the provisions for help in their solution were quite inadequate.

The needs of the pre-school child had been recognized for many years, but the facilities to meet these needs were hopelessly inadequate. Pre-school centres in Canberra were

quoted as an example of a service, developed in response to a need, by taking the people into full partnership in the planning of the project. For some years a number of parents had been agitating for the Commonwealth Government to build kindergartens similar to those in other capital cities, which would provide full day educational care for their children. After some time the authorities had formed a committee which included representatives of parents, the appropriate officials, and a number of experts in child health and child development. That committee had analysed the needs of pre-school children in Canberra; and arrived at the conclusion that the needs of the children and their parents could be met by the establishment of play centres. These were much cheaper to build and to operate than kindergartens, and were being provided in all suburbs.

For many years attempts had been made to provide some form of health education for primary school children. In some States, curricula of health education were under critical review. Suitable text-books were urgently needed; and also more extensive and intensive training of teachers. There was general agreement that, not only should health education be a well-taught subject, but the principles of healthful living should be incorporated into the total daily life of the children. Few attempts had been made to introduce health education into secondary schools, so the seminar showed keen interest in a pilot project about to be introduced in one of the States.

Adolescents had a wide range of problems, arising out of their attempts to adjust themselves to three worlds, that of childhood, that of their parents, and that of the other adults they meet in their daily work. The importance of clubs of various kinds as places where adolescents could learn to adjust themselves was recognized, but far too many adolescents did not belong to any club or group. The seminar suggested that the activities and achievements of the newly created section in the Western Australian Education Department which would provide for "the post-school youth", should be studied by all interested in the welfare of this group.

There were certain needs in respect of health education common to most adults, but in addition many groups of adults had needs peculiar to them. Industrial groups, in particular, had special problems arising from the nature of their work. An outstanding concern seemed to be the attitude of some trade unions towards the rehabilitation of men who had suffered a serious illness, which, although it precluded them from returning to their previous work, did not prevent them from doing useful work in another field of their trade or profession. Any difficulty in this matter might be resolved through group discussions within the unions. It was also felt that adult members of unions, both by individual and by corporate effort, could do much to help apprentices to adjust themselves to their entry into the adult world. Country lads in particular seemed to have a wide range of problems.

Another problem was presented by "working mothers". There was general agreement that the mothers of young children should not work outside the home; however, it was realized that many had to do this, and so had a wide variety of needs which were not fully understood. A young child deprived of the care and attention of its mother for long periods during the day was often strongly emotionally disturbed. Although mothers left their children at day nurseries and the crèches on their way to work and called for them in the evenings, their preoccupation with the burdens of work and home management made it difficult for the staff of these centres to work with these mothers as was so frequently done by the staff of kindergartens.

"Foodhandlers" constituted an important group in the daily work of health officers, since careless food handling was a possible source of infection in the community. Many employers and employees in the food industries were well informed of the hazards of food contamination, and did their utmost to apply their knowledge conscientiously, but there was still much ignorance and indifference. Perhaps the greatest difficulty came from the floating population of casual workers who moved from one position to another. It was agreed that this problem could be approached in a number of ways. The public should be repeatedly acquainted of their rights under the health acts in respect of good food handling practices. School children should be taught their rights as customers in food and confectionery shops. Ways and means of interesting and informing all workers in the food industry must be sought and applied. One health inspector outlined a programme he intended to put into action. Working through the Caterers' Association, he would call a meeting of proprietors and supervisors of food handlers. By discussions, he hoped that the problems of the industry would be reviewed and programmes of education

and satisfactory techniques developed; he hoped these plans would have the full support of the industry, since their own representatives had formulated them.

The aged and their needs had become a major public health problem in this century, when the expectation of life had increased greatly. This applied especially to persons living alone, many of whom required constant care and supervision because of chronic illnesses. This care was being supplied by District Nursing Services. In some places, these nurses had organized groups of neighbours to help care for their patients.

Some of the principles raised in this discussion of groups to be reached were as follows. A close study should be made of the groups with which it was proposed to work in order to determine their attitudes, needs, loyalties, interests and likely ways to enlist cooperation. The oblique approach was often more profitable than the direct one. Every suitable opportunity for a "teaching situation" should be used. Both official and unofficial leaders should be sought out and their help enlisted. Through guidance and suggestion, the concern of the group should be aroused, and the group should be stimulated to tackle the solution of its own problems, with expert assistance when required.

Methods of Health Education.

MR. LYNFORD KEYES (Manila) said that during the past few years a great amount of study and action research had been directed toward improving health education methods. Although no extravagant claims could be made, it was safe to say that many useful and sound ideas had emerged. Since all health workers were in some measure health educators, it seemed important that they should be willing to improve their understanding and use of the methods and media of health education. At the same time it had to be remembered that most people were inclined to teach or to educate others in the way in which they themselves had been educated, and the methods used were rather deeply ingrained. It followed from this that if educators wished to use modern methods they had first to change themselves.

The modern approach to health education exemplified a shift from the belief that information or knowledge alone could change people. Information alone would not change anyone's attitudes or habits. The educator should realize that he was dealing not with a brain only, but with a whole personality. The community could choose not to take advice. It was important to remember that the introduction of a new idea invariably presented a personal threat to the learner. So the problem came down to a knowledge of the people themselves. It was a question of working with and through people and not merely of telling them what they ought to learn. The health educator had to learn more about the so-called "two-way" education methods. These included committee work, councils, interviews, dramas, role-playing, projects, field trips, group discussions and others. Belief in this Socratic approach did not mean that the many didactic or one-way methods should be abandoned. On the contrary, these methods should become valuable tools and it was necessary to improve skill in their use. Such things as lectures, films, posters, leaflets, exhibits and models, to mention only a few, had a place of importance but not dominance within the framework of a total health education programme.

The selection of methods should depend on sound information about the problem to be tackled. The WHO Expert Committee on Health Education of the Public had laid down five criteria for the selection of methods. The methods should assure that the information would actually reach each individual; should attract and hold the interest of the people; should assure that the content and purpose of the new ideas were understood; should be seen by the people as a means to an important goal; and should assure active participation of the people. The closer the methods and media were to the people, the more effective would be their use. This might take longer, but the effect would be more lasting. As to cost, it was sometimes cheaper to pay health workers to work with people than to scatter pamphlets, show films and so on. If possible, methods should be tried out on a small group; this pre-testing made success more likely.

There was no evidence that costly media were superior or more effective than cheap ones. It was all very well to have beautifully printed and illustrated pamphlets, but such an expensive format might make local production impossible, and it was important to have posters, pamphlets and so on produced locally. This might take longer, but the effect lasted longer as well. In the choice of media, it was important to touch as many senses as possible, and to use media

which were as realistic as possible. Health councils were a good means of working on community or health problems, provided that they grew out of the needs and problems recognized by the people and were not organized by some control group. Many such organizations collapsed if they had been established too quickly and if the people were not with them. Health campaigns might be good if used for special purposes, but it was sometimes hard to follow up the work of special campaigns, once the excitement was over. "Self-surveys" were a valuable means of informing the public about health conditions and problems. These could be organized by the health authority and involved many individuals and groups in the collection of health data and information. While such a survey might not be as scientifically accurate as one done by experts, the interest and concern aroused were many times more valuable. Talks, lectures and panel discussions were purely information-giving methods, and it had to be remembered that the effect of a lecture faded quickly. Discussion groups were effective, for groups of from five to twenty people. This method was the principal one being used in the present seminar; members thus had an opportunity of assessing its value. The discussion group was also a valuable means of stimulating action, for decisions planned and approved by a well-integrated group were not lightly put aside. Films had their place; they were, however, complete in themselves and once made were not flexible. They were costly to produce, which in most cases precluded their production on a local level. The use of films "across cultural lines" often led to misunderstanding, ineffectiveness, and sometimes even to ridicule. Even for different groups or different areas in a country, films were often not suited to the people's values and traditions. Film-strips were cheaper and more easily made than films. "Flip charts" made a useful accompaniment to a lecture; the speaker could go back over his material and it was not necessary to darken the room to show them. Posters were useful in special campaigns; a poster could, however, convey only a single idea at a time. It was imperative to change posters frequently; if they were left up too long people simply ceased to see them. Health exhibits, if small and well planned, were effective; these, too, needed to be changed frequently. In some places, health museums had been used. Cinema vans with loud speakers had been tried, but in Mr. Keyes's opinion it was better to use the money for individual workers. Dramatic presentations and "mental health" plays had sometimes proved effective. In conclusion, Mr. Keyes observed that many of the methods he had mentioned were being tried in the seminar. Perhaps the participants of the seminar would be able to evaluate the different ways of learning at the end of the seminar.

Discussion.

The groups thought that the question of methods was closely tied up with the processes of learning and much of the discussion underlined ideas already considered. Most agreed that the "two-way" methods of communication were being illustrated in the work of the seminar, particularly in the experiences of discussion groups. Thus at the outset many of the participants had seen the group method mainly as a technique, or "selling device", whereas in later discussions it had been seen as a real means of finding out the needs of the community.

Mass campaign methods were examined, and it was agreed that campaigns should have clearly defined aims; that they should centre round a single theme rather than attempt to cover the whole field of health; that such a theme could be channelled into groups which could go on to stimulate further work; and that a campaign as a "vanguard approach" could be very useful.

There was a general feeling that health authorities should be ready to experiment with new techniques, but cautiously, using "pilot projects" and pre-testing. Various members outlined new projects which they intended to experiment with in their own communities. One group actually helped a member to prepare materials for a specific approach to food-handlers in his community, and worked out with him various stages in his project. All groups were concerned about the problems of suitable media of education. New types of teaching media should be used, adapted with discrimination to the needs of particular groups and to the opportunities offered by "teachable moments".

Evaluation of Methods of Health Education.

MR. P. PENTONY (Canberra) defined evaluation as the attempt to determine the effectiveness of a programme in achieving its intended purpose. "Pre-testing" had a more limited objective; in pre-testing methods of health education, the chief interest lay in barriers to success. To a certain

extent evaluation was going on all the time. It was said that in some districts anti-tuberculosis campaigns had failed; the campaign to prevent a flare-up in the poliomyelitis epidemic in Perth during the Royal tour had been successful; in point of fact efforts were continually being evaluated in the field of health education, as in any other field. No doubt many of its members had been evaluating the present seminar. The question therefore was not whether they should have evaluation, but how it was to be carried out, and particularly how systematic it was to be and how much time and effort were to be put into it. In general the more time and effort that were used, the more accurate would be the evaluation. On the other hand one might have to choose between getting on with some aspect of health education and carrying out an evaluation, especially if resources were limited. It seemed certain that one would often have to be content with what might be called a common-sense appraisal of an achievement, while on less frequent occasions a rigorous investigation of the efficiency of some particular programme might be desirable. Mr. Pentony went on to review the advantages of a thorough-going evaluation. In the first place, when it was desired to convince someone of the significance of a piece of work it was useful to have a clear-cut demonstration of its effectiveness. A broad appraisal might convince the converted, but not the sceptical. A rigorous evaluation also might help to decide between alternative methods of handling a programme. Again, to know just what they were achieving might provide motivation for people working on the programme. The importance of these considerations in any particular case would vary. In general, it seemed that they would become of major importance only when some changes were contemplated or were likely to eventuate.

The principles to be followed in conducting a vigorous evaluation of a programme were those common to any aspect of social research, namely, accurate and complete recording of information and the use of controls. The particular information wanted would be the state of affairs before a programme commenced and after it finished. A control group would be needed to ensure that some factor other than the health programme was not causing any change that might occur. Mr. Pentony illustrated his point by discussing a campaign to improve the hygiene of food-handling in smaller towns. He referred his hearers to a "Study of Rural Hygiene in Syria" by S. C. Dodd. Dodd had been interested in the effect which an itinerant health clinic was having on the Arab villages.

Industry had used the observer who appeared as just another worker. Methods of mass observation had also been used. In general two points emerged: a certain amount of planning was necessary to conduct an evaluation study, and some specialist assistance would probably be needed. The first point required stressing. It was difficult to impose a worthwhile evaluation study on a programme that was already in operation. On the matter of specialist assistance various points needed watching. Any effective study would make use of statistics. If statistics were to come into the picture, it was important that whoever was going to do the ultimate statistical analysis of the results should come into the study at the planning stage, because the design of experiments was now a very important function of the statistician. Again, advice on methods of collecting data might be obtained from social scientists. Such people might be available in the health department concerned, but most likely one would have to look for them at a university. In general university departments were interested in assisting any research project that was brought to their notice, but they often took their time about it. Of course, one might decide to hand over the whole study to a university department, but something might be lost by doing so. The people actually engaged in the health education programme would learn a great deal by carrying out their own evaluation.

As an instance of a practical type of evaluation project, Mr. Pentony described an investigation of a programme designed to increase the consumption of milk by certain low-income groups of rural workers. The programme had been designed to induce them to use non-fat dried milk. A group of women attending a maternal and child welfare clinic had been shown film-strips and posters, and were given free samples of dried milk. No evidence of change in the family milk consumption had occurred during the two-month period following the education programme.

Mr. Pentony discussed pre-testing of health education programmes, outlining certain essential conditions necessary for the success of any health programme. First it had to reach its audience physically; it had to attract attention and interest, it had to offer a means of satisfying a want or purpose; it had to be within the limits of the comprehension of the group for whom it was planned; its purpose had to be

clear; and lastly, it had to produce real learning; in other words, a number of the group should acquire and retain the information and attitudes essential for action. Mr. Pentony discussed methods of pre-testing a health campaign for these qualities.

Discussion.

It seemed that very useful and worthwhile evaluation could be carried out by simple methods involving comparatively little time or specialist skills. On the other hand it was sometimes very difficult to collect the information necessary to evaluate a project. The limitations of different methods of collecting data were considered with particular attention to questionnaires, the advantages and disadvantages of using children as informants, the need for tact and skill in interviewing, and the need for a multiple approach.

Some health education activities being carried out at present required evaluation; in particular there was much discussion about the value of health weeks. It was generally agreed that the aims of health week needed clear definition.

It should be possible to enlist the aid of many people other than those directly engaged in health work, to participate in evaluation. University staff and students, trainee teachers, research officers of education departments and government statisticians were mentioned. Some of the groups examined different materials used in health education. One group saw some film-strips and discussed weaknesses in technique and content. Another group spent considerable time examining and comparing posters.

One group raised the issue that evaluation involved something more than determining whether the goal of a particular campaign had been reached. It formulated the following principle:

Health education must be adjusted to the changing pattern of living in any social group. This necessitates constant and repeated evaluation of the total need in the group so that the maximum effectiveness of health education may be maintained.

Organization for Health Education.

The "Organization for Health Education" was introduced by a keynote presentation with three participants describing methods of organization for health education: one a government instrumentality, one a statutory body appointed by the Government, and one an association formed by voluntary effort.

Health Education in New Zealand.

Dr. D. TAYLOR (Nelson, New Zealand) described the organization of health education in New Zealand. He said that the Director-General of Health, his deputy and directors of divisions (public hygiene, tuberculosis, child hygiene, nursing, dentistry and so on) worked at head office in Wellington. The Central Health Education Committee was formed from their ranks and also included other members of head office staff. It formulated policy, allocated money (the health education grant was £32,000 in 1954), selected and purchased, produced and distributed, health education material and assisted district health education committees with their problems. Newspaper advertising was maintained on a national scale and members of the central committee were associated with the Mobile Health Exhibition and with the quarterly bulletin *Health* which had an estimated reader circulation of 130,000 to 150,000. The central committee was chaired by the Deputy Director-General of Health, who also gave radio talks on health twice weekly on a national link-up.

Each district committee consisted of the medical officer of health, the principal dental officer, the industrial medical officer, a nurse inspector, a senior health inspector and a clerk. It planned the programme for the district and produced an annual budget to be forwarded to the Central Committee. It also planned, purchased and produced health education material to be used locally at agricultural and pastoral shows, Maori health weeks, lectures to groups and so on. District committees also pre-tested health education material forwarded by the Central Committee and advised regarding the retention or otherwise of material already in use.

Field work in health education at district level was undertaken by the following persons: public health nurses, medical officers of health and school medical officers, dental nurses, industrial medical officers and industrial nurses, and senior health inspectors and their staffs. The public health nurse found opportunities for health education during home visits,

in the schools and to other groups. Health education was regarded as an important part of her work, and instruction in the subject was included in her introductory training to public health nursing and in her post-graduate and in-service training. Medical officers of health and school medical officers met parents and children during medical examinations. They gave lecture demonstrations to groups such as parents, food-handlers, school children, and women's organizations. They also belonged, usually as committee members, to various voluntary organizations concerned with the promotion of health. Dental nurses gave chairside instruction and lecture-demonstrations to groups of adults or of children. The principal dental officer and dental officers gave similar instruction. Industrial medical officers and nurses undertook health education in industry by personal interviews, lecture-demonstrations and the use of visual aids. Health inspectors gave health instruction in their areas during home visits connected with infectious disease investigation or with matters of hygiene. They also gave instruction to suitable groups and served on local voluntary bodies. The health education officer had a health education van and assisted in any of the activities mentioned. She gave lecture-demonstrations to groups, arranged local health exhibits and was responsible for publicity and health education connected with the mobile X-ray unit. She arranged the itinerary, housing, publicity and staffing (by the officers mentioned above) for the mobile health exhibition when it came to her district, and was responsible for the care and distribution of all health education material. At present health education officers were selected on ability, and after instruction at head office were given further and continuing in-service training at district level, but plans for a more extensive training were under consideration.

The Queensland National Health Education Council.

Dr. G. S. HAYES (Brisbane) described the Queensland Health Education Council which had a statutory constitution and was a body corporate. Membership was by appointment of the Governor-in-Council of the State of Queensland. The council had been made representative of interests associated with health and safety, including voluntary organizations, and at the present time its sixteen members represented the following organizations: the State Department of Health and Home Affairs, the State Department of Public Instruction, the University of Queensland, the British Medical Association (Queensland Branch), the Australian Dental Association (Queensland Branch), the Australian Red Cross Society (Queensland Branch), the National Council of Women and the Queensland Country Women's Association. In addition there were members representing business and other associated interests, such as broadcasting.

The powers and functions of the council were to acquire, promote, extend and disseminate education concerning all matters relating to the health of Queensland, and (without limiting the generality of this provision) including health, safety and well-being in industry and in traffic. The council might also make recommendations to the Governor-in-Council regarding any matter pertaining to health generally, and might be directed by the Minister to carry out investigations within its function. In carrying out such investigations it had the powers of an official commission. The council was financed by a fund called the Queensland Health Education Council Fund established by the *Health Acts Amendment Act of 1945*. The grant from the State Government in the initial stages had been only £2000 per annum, but with the growth of health education it had increased, and for 1954-1955 would be £20,000.

The council had appointed standing committees from within its membership to advise on specific aspects of its administration and function. At present these committees were: Finance and Administration, Publicity, Medical Panel and Development. The secretary, who was an official of the Department of Health and Home Affairs, also acted as liaison officer between the department and the council, and advised the council in all matters associated with policy, so that there was a coordination between the State Health Department's activities and those of the council.

The council had established its own full-time staff under the control of a publicity manager, who was a person trained in the techniques of commercial advertising. His staff consisted of copywriters, commercial artist, projectionist and clerical staff. The senior officers had been in the employ of the council for some years, and their training had developed them as specialists in the field of health education publicity.

The basic principles of the programme had been an effort towards a better understanding of personal and community hygiene, a reduction in the incidence of communicable

diseases, and a recognition of the early symptoms of disease, so as to reduce hospital bed occupancy through early medical treatment. In developing the initial programme, the council based its activities on the use of mass media, to ensure that essential health education could be quickly disseminated throughout the State with its widely dispersed population. At the same time it had directed its attention towards avenues involving a long-range programme, such as the introduction of health education in primary schools and the active participation of local government bodies.

The Development of a Community Project in Tasmania.

Miss L. MARTIN (Tasmania) said that the project she was about to describe had been selected because it provided a good illustration of the upsurge of a demand from the community and the cooperation of government departments and personnel with private citizens. She herself had been fortunate enough to witness all the essential stages. She was sure that elsewhere in Australia there were other projects which had grown or were growing in a similar way.

The beginning of interest in the welfare of retarded children in Tasmania must date back for many years, but, as was the case everywhere else, facilities had been almost non-existent. Small schools for high-grade backward children had existed in two centres; but, on the whole, backward children were mostly regarded as something that should be hidden away and not mentioned if possible. Before she had come to Tasmania one or two interested people had begun to use what propaganda they could, whenever the parent or relative of a backward child had come for help and advice. Miss Martin, in her capacity as psychologist in the Department of Mental Hygiene, had continued this propaganda, and whenever possible had discussed the problem of backward children in talks to community groups such as parents' associations, church groups, pre-school groups and so on. Parents of backward children had been urged to arouse community interest and where possible to have the matter brought under the notice of the Government. Departmental reports had mentioned it whenever the occasion seemed appropriate.

She had been in Tasmania for about six years when an opportunity arose. Government personnel and private citizens together with some community groups came together as the Mental Health Council, and this body had found a small hall which it urged the Government to purchase to start a day-training centre for the very backward children. This step had been taken, and it had made it possible to start a school auxiliary for parents of the children and interested members of the community. This was a most important achievement—it gave the parents an interest in working for the school, it removed their sense of isolation, and it had given them an opportunity to learn something about how to handle their children. This centre was now under the general guidance of a government-appointed advisory committee which worked closely with the auxiliary. After some time, the auxiliary (and this move had come entirely from this voluntary group) felt that the needs of other children in the State should be met. A public meeting had been called, to which State leaders, government officials and church and other representatives had been invited. At this meeting "The Retarded Children's Welfare Association of Tasmania" had been formed. A citizens' committee had been elected, to which representatives of the Education and Health Departments had been added.

The newly formed association had commenced the active formation of branches throughout the State. Miss Martin had addressed meetings of interested citizens in various parts of Tasmania. Publicity had been made available to both Press and radio. In most instances requests for public meetings had come from the communities themselves. Enthusiasm had been intense, and it had been hard to keep up with the demand for meetings. As branches of the Association were formed, each branch had sent two representatives to the central executive and in time the original committee had been replaced by this collection of delegates from all parts of the State, together with the two government representatives originally appointed. The branches had also drawn in other community groups, and had attempted to contact the parents of all retarded children in their areas. Other school auxiliaries had been drawn in.

At present the branches of the Retarded Children's Welfare Association were busy with three main objectives, namely, the raising of funds for a residential hostel for isolated children or those who had homes in which they could not be cared for; pressing for day-minding centres or training centres for the very backward; urging the Government through the Education Department to set up more schools

or classes for the high-grade backward children. The State association had now become affiliated with the Federal association. The executive had also set up a subcommittee on literature and publications. This had two aims—to collect and disseminate literature of general interest to branches and individual members, particularly advice to parents; and to carry on as much publicity and education of the general public as was possible. In conclusion, Miss Martin pointed out that the credit for most of this work should go to the community members. She had refused to have any position on any committee beyond being coopted as a technical adviser, making an exception only in the case of the subcommittee on literature and publications. Because the Retarded Children's Welfare Association was a new group, composed of diverse interests and personalities, experts were needed in the picture until the "growing pains" were over. Later she hoped that the major part of the work would be taken over by the citizens themselves.

Recruitment and Training of Health Education Workers.

Mr. R. K. GRAY (University of Western Australia) said that he would limit his remarks to one aspect of his subject, namely, training, and would further restrict himself to discussing the training of only one of the many professional groups which were concerned in health education, the professional health educator. All would agree that if health education was to be successfully carried on many people must contribute, each from his own vantage point. In electing to talk about the professional health educator, he was not in any way minimizing the importance of other workers or of the contribution they could and did make. He expected that in the discussion which was to follow his introductory remarks, attention would be drawn to what modifications and additions could be made to existing training courses for doctors of medicine, dentists, nurses, health inspectors and others so that they might be better equipped to contribute to health education.

In singling out for discussion the health educator's training, he was, of course, making a basic assumption to which his hearers might not all agree. He himself believed that such workers were necessary and must be trained adequately if they were to be successful. Dr. Thomas D. Wood had defined health education as "the sum of experiences which favourably influenced habits, attitudes and knowledge relating to individual, community and racial health". Another definition put forward by Dr. Ruth Grout was as follows: "Health education is the translation of what is known about health into desirable individual and community behaviour patterns by means of the education process." These definitions suggested that the role of the health educator was to create teaching-learning situations that would provide experiences which would influence the health behaviour of individuals in desirable ways. Two avenues presented themselves, the schools and the community. Consideration should be given to planning courses to equip a health education teacher to work in the schools on the one hand, and a health education officer to take his place as a member of the health department team on the other.

The health education teacher's task was to conduct, under the direction of the education authority, a programme of health instruction, to assist in the supervision and maintenance of a healthful school environment, and where required to give assistance in other aspects of the school health programme. The health education officer operated in a wider and less clearly defined field. His task was to conduct a programme of health education under the direction of the public health authority. The course of training could be viewed as having two main strands. The first should provide an understanding of the origins, growth and development and functions of the human organism and a knowledge of the many personal and environmental factors which caused deviations from health. The second should include educational principles and procedures and the psychological and sociological nature of the educand. In addition it should provide specific knowledge and skills in the methods, techniques and media of health education, and a study of public health organization and administration.

Discussion.

The groups agreed that health education workers fell into two categories. The first included doctors, nurses, teachers, health inspectors, infant welfare sisters and many others who carried out a great deal of health education as part of their daily work and whose contribution to health education in the community was of major importance. The second category comprised professional workers who had made

health education their career. With regard to the first group it was agreed that "in-service training" could strengthen greatly incidental health education. The worker's own understanding of human behaviour might require reinforcement so that he or she understood how to use the interests of the community, its beliefs, attitudes, needs, its culture and its tendency to follow natural leaders. The incorporation of health education into the basic training of several professional groups was regarded as very important.

As to the professional "health education specialist", his role would be that of a coordinator, to facilitate the work of other groups, to help them extend their activities, to assist them in the organization of in-service training for their particular group, to advise where special problems arose and to help in the planning and evaluation of particular programmes. The majority of members felt that there was a need for coordination in health education in Australia by professional "health education specialists"; a minority did not agree that the need existed at present. Several members dissented strongly from the suggestion that a new profession should be introduced, feeling that it was far sounder to use the solid foundation of well-established professions.

The proposals for specialist training put forward in Mr. Gray's paper were dissented from by all groups. Instead, alternative proposals were discussed, including the adaptation of certain existing university courses in Australia, or the training of health educators overseas.

The Role of Various Professions in Health Education.

The seminar participants broke off into professional groups for one discussion period to consider the contribution which they felt their profession could make towards a health education programme in the light of its present community service. It was evident that each group represented felt that it had a major contribution to make, and nearly all of them emphasized the importance of health education training in their professional field as part of a syllabus of training and for in-service refresher courses. Some groups pointed out the opportunities they had for reaching community members at the moment when they needed help, for example, nurses, doctors, dentists, health inspectors, physical educators. Several groups stressed the need for selection of people whose personality and attitudes would make it easy for them to work with people in the field. Most people expressed the wish to make their colleagues aware of the need for health education in their particular area.

Difficulties anticipated in carrying out their aims ranged from the teachers' grave concern that the secondary school course in Australia made no provision for health education courses to the health inspectors' plea of insufficient staff or budget. All groups, however, seemed to feel that, with adequate training courses, sound health education could be carried out by their members. The medical practitioners asked that the control of health education should remain with the medical profession, but other members pointed out that several very effective health education projects operating in the community today were not directly under such control, though working in close cooperation with medical practitioners.

Professional group reports included the following recommendations.

Medical Practitioners.—"Members of this group are convinced that there is an urgent need for the development of health education in the Australian community. The control of health education in Australia should remain with the medical profession. The profession throughout the Commonwealth should be made aware of the possibilities of health education in the preservation and betterment of health. We consider that this should be accomplished through the following agencies: departments of health; the British Medical Association; universities, especially faculties of medicine, dentistry and education; in some States teachers' colleges; nursing and other ancillary professions."

Dentists.—The dentist, it was held, could be a key figure in helping to arouse an awareness in the community for the need for dental health education. The Australian Dental Association and dental scientists could supply information to interested groups. Schools should provide instruction in dental health.

Nurses.—The role of the nurse in health education was stated to be very important because the very nature of her work gave her so many opportunities for personal contact with individuals, families and community groups at times when they were most receptive. Nurses were essential members of many team efforts in health education, for

example, maternal and child care programmes, district nursing, nursing care in homes, in hospitals and in industry.

Educationists.—The teachers agreed that organized education was a vital and most positive feature of the whole scheme of health education. While there was a place for a planned approach to health education in the schools, there was also a need to make teachers aware of wider concepts of health teaching both for incidental teaching throughout the school day and in planned projects and activities, and of the influence of the school in the promotion of mental health. Particular attention was drawn to the fact that the school environment often militated strongly against the development of good health habits in a child.

Health Inspectors.—By working with local government bodies, and through daily personal contacts, the health inspector, if carefully selected and trained, was in a key position to influence education in health matters through various aspects of environmental sanitation, food handling, rodent and pest control and other matters.

Physical Educationists.—A great opportunity for providing experiences to develop desirable personal and community health habits and attitudes existed in the field of physical education, such as team games for social skills, situations for safety teaching, goals for motivating desirable eating habits and the development of healthy physical recreations. The physical educationist should be trained to play a greater part in the total health education programme of the school.

Nutritionists.—Positive attitudes to good nutrition and sound eating habits could be developed with the help of dietitians and nutritionists. Information could be made available through Commonwealth and State health departments, and direct service to the community could be given through schools, institutions, parent clubs, caterers and food-handlers, while indirect service could be given in other ways.

Publicity Officers.—These were part of the health education team, and could help in the promotion of desirable health and safety attitudes by gathering information, preparing and disseminating publicity and educational material, and selection and use of appropriate media.

Social Scientists.—Social scientists stressed the importance of their varied professions in contributing to health education and in promoting social conditions which would be conducive to the highest level of mental health. Specific contributions could be made through assistance in basic and in-service training of health education workers and others, selection of personnel, theoretical advice and research on the learning process, practical help in selecting and evaluating media, help in the study of the interests, attitudes and needs of individuals and groups to be reached, and dissemination of mental health knowledge through professional work with community groups.

Library.

A library of books, pamphlets and journals relating to public health and health education was provided for members of the seminar.

Visual Aids.

Two evenings were devoted to the showing of films selected from those brought to the seminar by participants. Some of the subjects illustrated were the prevention of hydatid disease, the prevention of dental caries, sex education in schools, the work of a child guidance clinic and health conditions in the Adelaide Hills. Film-strips illustrating family problems were shown.

One evening was devoted to demonstration of the arts of making posters, flip-charts, flannel-graphs and so on. Some of these, produced by members on the spot, were used to illustrate informal lectures during the seminar.

Inspection of Health Centres.

A tour of baby health centres, pre-school centres and schools in Canberra was organized and conducted by Dr. Edith Clement, Schools Medical Officer in the Federal Capital Territory.

Sex Education.

A lecture on sex education was given by Associate Professor F. Dumas (Melbourne), in which he distinguished between sex education and sex information. The former was character education and depended very strongly on examples of family and community life.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on December 9, 1954, at the Robert H. Todd Assembly Hall, British Medical Association House, 135 Macquarie Street, Sydney, Dr. T. Y. NELSON, the President, in the chair.

Medical Rehabilitation.

Dr. NAOMI WING read a paper entitled "Medical Rehabilitation" (see page 705).

Dr. B. G. WADE read a paper entitled "Medical Rehabilitation" (see page 710).

Mr. THOMAS STEWART, aged twenty-six years, an ex-serviceman of the United States Navy, attended the meeting at the invitation of Dr. Naomi Wing, and gave an account of his own injuries and rehabilitation. He said that he was married and had two children. Before his accident he had been a foreman carpenter. A demolition explosion in May, 1952, had been the cause of his injuries, which included the loss of both hands to a distance of about two and a half inches above the wrists, and also other bodily injuries; from the latter he was suffering no disability. After the accident he had been taken to a hospital at a distance of approximately 27 miles. He had been cared for by an orthopaedic surgeon. In July, 1952, he was allowed to go home for two weeks, and after that he was returned to the same hospital for further medical observation and treatment. Also at that time he underwent the revision of both arms. Late in September, 1952, he was sent to San Francisco and entered the United States Naval Hospital in Oakland. Under the direction of Dr. Thomas Catty he was given a complete course of rehabilitation, which lasted until December 20, 1952. On his arrival at the hospital, he was first given a complete course of physical therapy, which lasted for approximately two weeks. After that course he was fitted with his prosthetic appliances and began the course of occupational therapy. He first had to accomplish the complete use of his arms, and their proper operation with rounded rather than square movements. For this he was taught leathercraft work—tooling and lacing of leather—and also weaving rugs. There was also an obstacle board, which he had to complete every day. Upon this board there were various attachments such as light fixtures, telephone switches, water taps, practically everything that the patient would come in contact with in the future. From that board he learned the different positions in which to hold his appliances, to rotate them, the position in which to have the wrist flexion unit for such a task as turning a tap on or off with ease *et cetera*. Most of that training was done in the mornings. During the afternoons the patients had a fair amount of athletic exercises. One was swimming in the indoor pool; another was horseback riding. They were also instructed in driving a motor-car, and they obtained their driving licences before being discharged from the hospital. Various other recreations were provided, especially for the week-ends. The patients were enticed to go amongst the public. That was accomplished by giving the handicapped patients the opportunity of seeing all types of sports free of cost, and also free dinners at "top" restaurants. They were invited out by various organizations to participate in their programmes. They were taken amongst the public as much as possible, in order that they might be helped to realize and overcome the reactions of members of the public to a handicapped person. Mr. Stewart said that that aspect had been a great help, because when he left the hospital on December 20, 1952, he was completely rehabilitated, and he had never hesitated to go amongst the public, or to take his wife to dances, parties or any other form of entertainment. He was at times aware of his appliances; but he had never let his disability hold him back from living a normal life. On his return home after his rehabilitation, he had become a real estate agent, and his work required him to meet the public about every hour of the day. Although it was a different type of work from that to which he had been accustomed, he had found it to provide him with a comfortable living. Mr. Stewart said that one important thing he wished to stress was the fact that when a person was handicapped, in the majority of cases he was better off working for himself than for an employer. That was one thing that nearly all handicapped people tried to do, and he had found his opportunity in the field of real estate.

Mr. Stewart then demonstrated some of the ways in which he could use his prosthetic appliances; he took off his shirt, picked up a tumbler and a small piece of cigarette ash, and carried out various other movements.

Dr. R. A. MONEY spoke on the rehabilitation of paraplegics. He said that a centre for the rehabilitation of paraplegics would naturally be only a part of a general rehabilitation centre, but a very specialized part of it. In his opinion the most practical one and the best suited to Australian conditions was the paraplegic centre at Toronto, Canada. It had originally been started for the Veterans' Administration, but had developed into a composite centre run by an independent board of trustees; they struck a rate of so many dollars a day, and were prepared to accept any paraplegics, whether war veterans, workers' compensation patients, well-to-do civilians or charity patients, so long as they were paid for. Dr. Money thought that such a centre would be ideal in Sydney. He had been trying to find out how many paraplegics there were in hospitals in New South Wales at any one time, and figures were not yet available; but he thought that there could not be more than 50. They would not all need to be in a centre at once; they would require indoor treatment at first, to be put on the right track, and then perhaps they could be readmitted once a year or every second year to have some adjustments made.

Dr. Money then showed a number of slides illustrating devices used in the rehabilitation of paraplegics. He referred to the need for bringing gradually into the upright position a patient who had spent a long time in the recumbent position, on account of the danger of cerebral anaemia and blackouts, and showed a photograph of a board used for that purpose. Dr. Money also mentioned the importance of a wheel chair in the life of a paraplegic, and indicated the need for it to be the right height, so that the patient could easily slide himself onto beds, toilet seats *et cetera*. A wheel chair should have front wheels of correct diameter—for example, five or six inches for indoor work and eight inches for outdoors—and adequate brakes. Paraplegics should have the remaining muscles above their lesions strengthened, so that they could use them to control their trunk and their lower limbs. One of the slides shown by Dr. Money illustrated some of the exercises used to strengthen the muscles of the upper limbs and the shoulder girdle. Another slide showed how necessary it was that the wash-basin should be high enough for the arms of the wheel chair to fit underneath it. Several slides showed the apparatus fitted to paraplegics to enable them to stand, walk and sit. The apparatus had to be very light, and was usually made of tubular duraluminium or one of the newer metals used in aircraft construction. It had to be able to be flexed at the hip and at the knee, and it had to have locking devices by which the knee could be locked. Other slides showed electric typewriters in use, patients at recreation *et cetera*. Dr. Money said that Guttman was one of the first to have a paraplegic centre as such; some of the pictures shown were taken at his centre, Stoke Mandeville. Other pictures came from Rusk's book, and showed various parts of a house arranged for paraplegics.

Dr. Money went on to say that the psychological aspect of rehabilitation was very important; it had to be begun at the outset of a patient's illness or immediately after the receipt of his injury. Patients should not be told that they would not recover; that should be left to dawn on them over the years. Dr. Money discussed the case of a young naval officer who had been made paraplegic by an injury sustained during the second World War. The patient had been told at the outset that it would be at least two years before it would be known whether he would recover or not. He was an intelligent man, and had rehabilitated himself to the extent of taking his arts and law degrees at Oxford University and practising at the Inns of Court in London as a barrister. He had had a certain amount of rehabilitation in London, and then went to Rusk's Institute in New York. There he learned a great deal, especially about the upright position and about walking; the English people were more content to stick to the wheel chair. The patient was also able to drive his motor-car. Dr. Money pointed out that the slides he had shown, and also the accounts given by Dr. Wing and Dr. Wade, had indicated clearly what could be done for paraplegics. Those in his series all had lesions in the thoracic or lumbar level; much could also be done for those with lesions in the cervical level.

Dr. M. R. FINLAYSON stressed the importance of rehabilitating the industrial worker. He said that all industrial physicians would agree that one of the most interesting parts of their work was the rehabilitation of workers who had been injured or who had been ill or had an accident apart from their work. In many cases such patients could

be raised from the unproductive pensioner stage to that of a productive worker. He emphasized the importance of Dr. Wing's reference to the need to concentrate on remaining abilities rather than on disabilities. Dr. Finlayson said that in the Department of Railways they had been able to establish an occupational therapy unit at comparatively small cost. The work that had been done in, roughly, the last two years had been most stimulating. Dr. Finlayson referred to the American patient shown at the meeting by Dr. Wing; he laid emphasis on the fact that it was not only his physical condition that was remarkable, but his mental attitude, and that one of the main tasks of rehabilitation from the very beginning was work on the patient's mental attitude—the sooner he could be placed in the hands of a competent occupational therapist, the better would be the result. Dr. Finlayson regretted that all practitioners had not heard what had been said, and had not seen the pictures that had been shown at the meeting, because there were many members of the medical profession who did not appreciate the possibilities of rehabilitation, and who did not take it into consideration in dealing with their patients. At the Ninth Session of the Australasian Medical Congress (British Medical Association), to be held in Sydney in 1955, there was to be a plenary session on rehabilitation. Dr. Finlayson hoped that all practitioners would take part in it, and that the subject would receive more publicity in Australia than it had received up to date.

Dr. Nelson, from the chair, said that he wished to refer to one form of rehabilitation that had not been mentioned; it was strictly "habilitation"—that of the cleft palate patient. The word "rehabilitation" could be extended into almost every field of medicine; but the preparation of the cleft palate patient for his place in society was one of the most important problems that he (Dr. Nelson) had to face. He had been interested to hear a recent address by an orthodontic surgeon (the orthodontists played a big part in that field); his opening remark was that he thought all the people concerned in the problem should at least learn to speak one another's language; they should know what the other people could do, and what they were talking about. Dr. Nelson thought that could be extended into the whole field of rehabilitation; it was necessary that people should

be aware of what could be done. That was the start, to be made before any ambitious scheme of rehabilitation could be undertaken.

Dr. Wing, in reply, thanked Dr. Money for showing the extra slides. She said that Dr. Money had extensively investigated what was being done overseas, and felt as she did, that it was wrong that people should be grossly neglected as they were in Australia. She was sure that now that a start had been made, interested and influential people in industry would support the move. Dr. Wing said that she had discussed the project with many people, including Sir Herbert Schlink; he was very interested. She had suggested to him that pilot centres might be started at some four or five hospitals, with the object of showing some results over a period of perhaps two years, and then aiming to establish one large well-staffed, well-equipped rehabilitation centre. Dr. Wing hoped that those present would be stimulated to do a little reading about the matter, and to pass the word around to any influential patients and friends who might be willing to give a donation to start the project in Australia.

Dr. Wade, in reply, said that various parts of the rehabilitation problem had been discussed, and it had to be realized that the two parts taken by Dr. Wing and himself were only one very small section of the whole question. The rehabilitation work in England in particular was excellent; at Stoke Mandeville the general demeanour of the patients and the happy life they were leading had to be seen to be believed. Papworth Village was the rehabilitation centre for the tuberculous; it was now completely self-supporting. They had very large workshops; they supplied houses for all the patients when they left hospital so that families were not separated; they had schools, libraries, recreations, churches. They were self-supporting in the amount of revenue they received for the work they did. For example, they printed one-third of all the telephone directories for England. Dr. Wade said that there were very many rehabilitation centres in England; and he had selected for discussion the incapacitated housewife, because so far as Australia was concerned no one was interested in her—she was only a nuisance. Everyone wanted to send such women somewhere else; there was no home for them except a few

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED APRIL 23, 1955.¹

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism ..	4(1)	3(2)	8(4)	1	..	..	..	..	16
Amoebiasis	1(1)	..	..	..	1
Ancylostomiasis	2	..	2
Anthrax
Bilharziasis
Brucellosis	1	..	..	..	..	..	1
Cholera
Chorea (St. Vitus)
Dengue
Diarrhoea (Infantile) ..	17(11)	17(16)	4(4)	..	..	..	..	..	38
Diphtheria ..	7(2)	14(14)	1(1)	1(1)	18(17)	..	2	..	48
Dysentery (Bacillary)	10(9)	4(2)	..	3	1(1)	..	..	18
Encephalitis	2(2)	..	..	..	..	..	1	3
Filariasis
Homologous Serum Jaundice
Hydatid
Infective Hepatitis ..	51(13)	51(31)	..	9(2)	6(2)	..	..	..	117
Lead Poisoning	1	..	..	..	..	..	1
Leprosy	1	..	..	..	..	1
Leptospirosis	1	..	..	..	..	..	..
Malaria	1	..	2
Meningococcal infection	1(1)	1(1)	..	..	..	..	..	2
Ophthalmia	3	..	..	..	3
Ornithosis
Paratyphoid
Plague
Pollomyelitis
Postural Fever ..	7(4)	3(2)	8(3)	3(1)	1	1(1)	..	..	23
Rubella	9(6)	..	..	3(1)	..	..	..	12
Salmonella infection	2	..	2
Scarlet Fever ..	19(5)	20(15)	6(1)	3(3)	3(1)	..	..	..	60
Smallpox
Tetanus
Trachoma	1	..	..	..	1
Trichinosis
Tuberculosis ..	27(18)	33(25)	24(20)	11(10)	11(5)	3(2)	1	..	110
Typhoid Fever
Typhus (Flea-, Mite- and Tick-borne) ..	1	..	1	..	..	..	..	..	2
Typhus (Louse-borne)
Yellow Fever

¹ Figures in parentheses are those for the metropolitan area.

"convalescent homes"; nobody helped them except the family, sometimes grudgingly, because someone had to stay at home and look after them. They were really a tragic race. In England there were many geriatric hospitals, in which the minimum admission age was sixty years. People who had been injured or had become ill could be admitted to them, rehabilitated to a certain extent, and then sent home with aids of the type that Dr. Wade had shown, to carry on. Something of that sort was badly needed in Australia.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Examination Results.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that the undermentioned candidates satisfied the examiners at the recent examinations for Part I of the various medical diplomas of the University of Sydney as shown:

Anesthesia: B. S. Clifton, Jeanne M. Collison, B. W. Gunner, K. W. Macleod, E. H. Morgan, B. J. Pollard, B. White, Helen M. Winton.

Dermatological medicine: J. E. Cramer, D. A. W. Downie, L. J. Kelly, H. W. Linn, B. McGaw.

Gynecology and obstetrics: P. M. Elliott.

Laryngology and otorhinology: B. P. Scrivener.

Ophthalmology: P. F. Anderson, P. H. Hanbury, H. A. Handley, R. W. Winn.

Psychological medicine: Clara Campbell, F. J. Kyneur.

Diagnostic radiology: B. Collings, P. L. T. Ilbery, R. G. Jenkins, B. V. Mutton.

The Cedric Cohen Memorial Prize.

The Senate of the University of Sydney has accepted an offer by the Ophthalmological Society of New South Wales to establish a prize of five guineas, to be known as "The Cedric Cohen Memorial Prize", which is to be awarded each year to the candidate who obtains the highest pass in the final diploma of ophthalmology examination.

The Royal Australasian College of Physicians.

VISIT OF SIR RUSSELL BRAIN.

SIR RUSSELL BRAIN, President of the Royal College of Physicians, London, will be visiting Melbourne from May 16 to 19, 1955. He will be attending a clinical demonstration to be held at the Royal Melbourne Hospital on Wednesday morning, May 18, at 10 a.m., and will be delivering a lecture on "Exophthalmos" in the lecture theatre of the Anatomy School, University of Melbourne, at 8.30 p.m., on Wednesday, May 18. All members of the medical profession are invited to be present at these functions.

Notice.

AUSTRALIAN RED CROSS SOCIETY.

A SCIENTIFIC MEETING arranged by the National Blood Transfusion Committee of the Australian Red Cross Society will be held in the Stawell Hall, 145 Macquarie Street, Sydney, on Monday, May 16, 1955, at 8 p.m. The programme is as follows: "The Availability of Iron in Meat: Some Experiments Using Radioactive Iron", Dr. R. J. Walsh; "The Transfer of Iron to the Fetus in Utero", Dr. I. Kaldor; "The Value of Convalescent Serum in the Prophylaxis of Rubella", Dr. H. K. Ward; "Linkage of Group A and B Polysaccharides to Group O Red Cells", Mrs. Ilse Brading; "Blood Groups of Twins", Miss Olga Koopzoff.

Medical Appointments.

Dr. A. J. Canny has been appointed a member of the Queensland Institute of Medical Research, nominated by the Senate of the University of Queensland.

Dr. R. D. Hammill has been appointed a member of the Medical Board, Port Pirie, South Australia, pursuant to the *Workmen's Compensation Act, 1932-1951*.

Deaths.

THE following deaths have been announced:

COFFEY.—John Coffey, on April 27, 1955, at Ascot, Queensland.

COLLINS.—Joseph Francis Collins, on April 30, 1955, at Deewhy, New South Wales.

Diary for the Month.

- MAY 16.—Victorian Branch, B.M.A.: Finance Subcommittee.
- MAY 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- MAY 18.—Western Australian Branch, B.M.A.: General Meeting.
- MAY 19.—Victorian Branch, B.M.A.: Executive of Branch Council.
- MAY 19.—New South Wales Branch, B.M.A.: Clinical Meeting.
- MAY 24.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all contract practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

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